MITSUBISHI ELECTRIC

SPLIT-TYPE,HEAT PUMP AIR CONDITIONERS

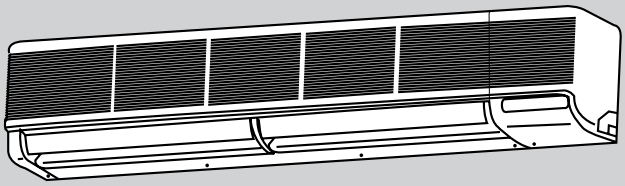
No. OC120

# TECHNICAL & SERVICE MANUAL

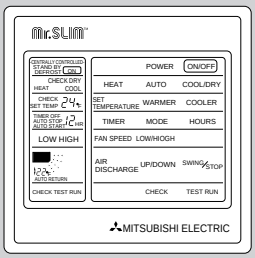
## Series PKH Wall Mounted

<Indoor unit>

Models **PKH18FK / PUH18EK**
**PKH24FK / PUH24EK**
**PKH30FK / PUH30EK**
**PKH36FK / PUH36EK**



Indoor unit




REMOTE CONTROLLER

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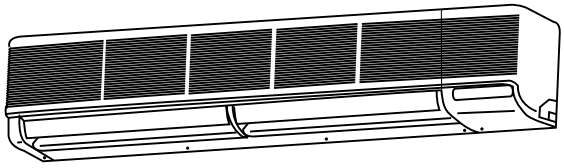
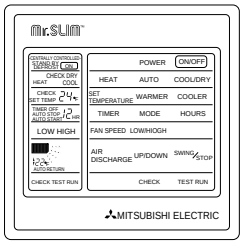
The Slim Line.
From Mitsubishi Electric.

Mr.SLIM

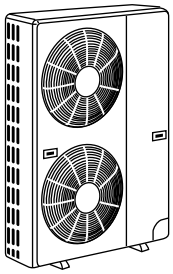
# 1 FEATURES



Indoor unit




Remote controller



PUH24EK
Outdoor unit

| Models | Cooling capacity / Heating capacity | SEER |
|---|---|---|
| PKH18FK | 18,000 / 18,600 [25,100] Btu/h | 11.1 |
| PKH24FK | 24,000 / 25,000 [31,500] Btu/h | 10.2 |
| PKH30FK | 30,000 / 33,000 [40,500] Btu/h | 10.6 |
| PKH36FK | 34,200 / 38,000 [45,500] Btu/h | 10.5 |

## 1. COMPACT DESIGN

The PK series models have been downsized and now require such minimal wall space that they can even be installed above windows. For the PKH18/24FK, 13in of wall space between the ceiling and the window allows “above window” installation (14.5in for the PKH30/36FK)

## 2. A FURTHER REFINEMENT OF COMFORT WITH NOISE SUPPRESSION

Remarkably low-noise operation has been achieved through the development of a “near-silent” fan and a design which minimizes airflow resistance.

## 3. AUTO FLAP SHUTTER

With a simple flick of the OFF switch the air outlet can be closed off with a shutter. The shutter also functions as a flap during operation to adjust the air flow angle, with “Auto Angle 1” securing a comfortable air flow.

## 4. INSTALLATION : FAST AND ENDLESSLY ADAPTABLE

**(1) External piping**

An external piping connection of 24in and a very light body promote trouble-free installation for PKH18FK.

**(2) Multi-directional piping**

Multi directional drain and refrigerant piping rodically improves flexibility in selecting installation layouts. PKH18FK drain piping can be installed in 5 directions, while PKH30/36FK models boast refrigerant piping in 4 directions and drain piping in 2 directions.

**(3) Back plate installation guide**

The back plate installation guide gives clear instructions on installation positions. The enlarged back plate secures the unit firmly to the wall, while the support piece which lifts the unit makes left side piping work much easier.

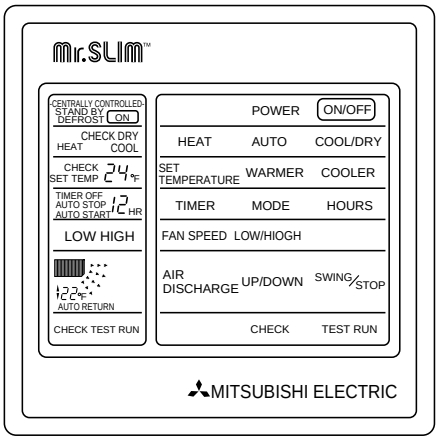
**(4) Front power supply box**

The front power supply box allows electrical wiring work to be performed easily even after the indoor unit has been fully installed. All the screws for the indoor unit can be tightened from the front side thus ensuring smooth installation. (only for PKH18/24FK)

**(5) Easily removable filter**

The presence of thumbscrews on the filters means that the filters can be quickly and smoothly removed. (only for PKH30/36FK)

## 5. ADVANCED MICROPROCESSOR




**(1) Easy to Use Microprocessor**

**1) Ultra-Thin Remote Controller**

The streamlined, square controller is designed to blend with any kind of interior and the adoption of a sophisticated microprocessor allows you to carry out a wide range of operations easily.

**2) Ultra-Thin Remote Controller**

Units operation mode, set temperature, room temperature, timer setting, fan speed, louver operation, and air flow direction are displayed on the remote controller with the easily understood visual Liquid Crystal Display (LCD).

**3) Convenient 24-Hour ON-OFF Timer**

The timer allows Mr.SLIM to be switched on or off automatically at the time is shown on the LCD.

**4) Self-Diagnostic Feature Indicates Instantly**

In the rare case when a problem occurs, the unit stops operating and the set temperature indicator changes to the self-diagnostic indicator, indicating the location of the fault.

If the check switch is pressed twice, the unit stops operating and the check mode is initiated. The cause of the most recent problem stored in the memory is displayed on the LCD. This is extremely useful for maintenance purposes.

**5) Useful Memory Feature for Storing Instructions**

The previous set value is memorized so that constant temperature control can be obtained. This is convenient when, for example, a power failure occurs.

**(2) Non-polar Two-Wire Remote Controller Cables**

The non-polar, two-wire type remote controller cable is slim, installation is simple and troublefree. Remote controller wire can be extended up to 550 yards.

**(3) Automatic Cooling / Heating Changeover Operation**

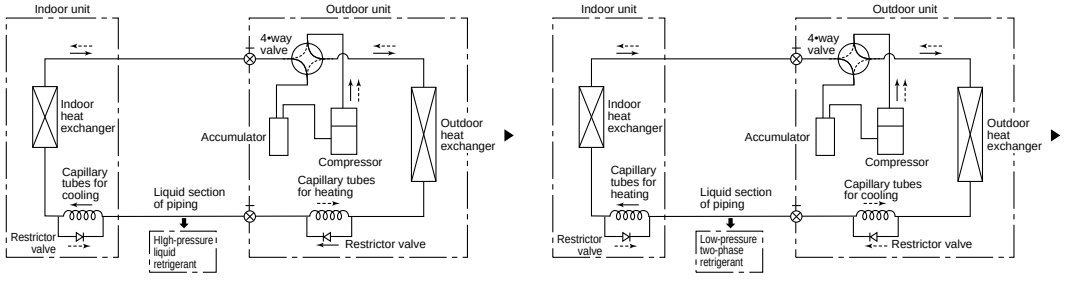
An automatic cooling and heating changeover operation system is provided to ensure easy control and year-round air conditioning.

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperatures as low as 23°F.

## 6. REDI-CHARGED REFRIGERANT SYSTEM

### PRE-CHARGE REFRIGERANT REQUIRED FOR MAXIMUM PIPING LENGTH AT SHIPMENT. PREVENTING TROUBLES DUE TO SHORTAGE OF REFRIGERANT.

The unique refrigerant circuit and a large accumulator always controls the refrigerant to its optimum condition regardless of the length of 164ft maximum or 25ft minimum. The additional refrigerant charging work at the field which often caused uncertain problems heretofore is completely eliminated. This unique system serves to improve the quality of work and reliability, and also helps to speed up the installation work.



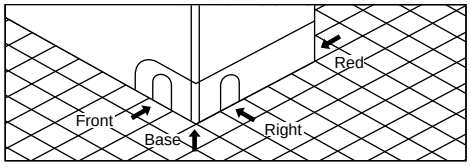

With normal circulation systems, a high-pressure refrigerant, condensed for cooling by the outdoor heat exacanger, is reduced in pressure by capillary tubes in the indoor unit after passing through the restrictor valve in the outdoor unit (see Figure 1). With the new circulation system, the direction of the restrictor valve is reversed as shown in Figure 2, and the condensed high pressure refrigerant is reduced in pressure by the capacity tubes in the outdoor unit. This results in a “two-phase refrigerant” of reduced pressure in the liquid section of the piping, The density of this two-phase refrigerant is 1/3~ 1/2 of that of the high pressure liquid refrigerant, and thus is required in smaller amounts (see Figures 1 and 2). As a result, the length of the piping can be extended further, and the effects of height differences are reduced. These new circulation system are also equipped with a large accumulator which allows the refrigerant required for the 100ft piping length to be enclosed in the outdoor unit. The result is an air conditioner that requires no charging unless piping is extended beyond 100ft.

## 7. HIGH RELIABILITY AND EASY SERVICING

In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism (cooling), an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

## 8. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

Piping on the outdoor unit may be connected from either of four directions: front, rear, side or beneath the base. This easy-access design makes it possible to install a number of units in a compact arrangement at a single site. The outdoor unit allows for unheard-of flexibility in detemining a piping layout, thus greatly simplifying installation.




## 9. FRONT-ACCESS FACILITATES MAINTENANCE

The outdoor unit has been designed with a frontaccess service panel that allows easy access to all maintenance point, regardless of the installation layout. What's more, this front panel may be removed by loosening only two screws. It all adds up to greatly simplified maintenance work.

## 10. NITROGEN GAS IS CHARGED TO INDOOR UNIT

Indoor unit and refrigerant pipes are charged with nitrogen gas ($N_2$) instead of R-22 before shipment from the factory.

# 2 SPECIFICATIONS

## MODELS : PKH18/24/30/36FK

| Item \ Model | | | PKH18FK | PKH24FK | PKH30FK | PKH36FK |
|---|---|---|---|---|---|---|
| Capacity | Cooling *1 | Btu/h | 18,000 | 24,000 | 30,000 | 34,200 |
| | Heating *1 | Btu/h | 18,600[24,100/25,100] | 25,000[30,500/31,500] | 33,000[39,100/40,500] | 38,000[44,100/45,500] |
| | Heating *2 | Btu/h | 10,700[16,200/17,200] | 14,700[20,200/21,200] | 19,000[25,100/26,500] | 19,600[25,700/27,100] |
| Moisture removal | | Pints/h | 5.3 | 7.0 | 9.1 | 10.5 |
| Power Consomption | Cooling *1 | kW | 1.79 | 2.36 | 3.12 | 3.44 |
| | Heating *1 | kW | 1.56[3.16/3.46] | 2.37[3.97/4.27] | 3.02[4.82/5.22] | 3.54[5.34/5.74] |
| | Heating *2 | kW | 1.34[2.94/3.24] | 1.92[3.52/3.82] | 2.48[4.28/4.68] | 2.65[4.45/4.85] |
| EER | *1 | | 10.1 | 10.2 | 9.6 | 9.9 |
| SEER | | | 11.1 | 10.2 | 10.6 | 10.5 |
| HSPF | | | 7.2 | 6.8 | 7.1 | 6.9 |
| COP | *1 | | 3.5 | 3.1 | 3.2 | 3.1 |
| | *2 | | 2.3 | 2.2 | 2.2 | 2.2 |
| INDOOR UNIT MODELS | | | PKH18FK | PKH24FK | PKH30FK | PKH36FK |
| External finish | | | Munsell 3.4Y 7.7/0.8 | | | |
| Power supply | | V,phase,Hz | 208/230,1,60 | | | |
| Max.fuse size (time dalay) | | A | 15 | 15 | 15 | |
| Min.ampacity | | A | 12 | 12 | 13 | 13 |
| Fan motor | | F.L.A. | 0.5 | 0.5 | 0.6 | 0.6 |
| Booster heater | | A(kW) | 7.6/8.4[1.6/1.9] | 7.6/8.4[1.6/1.9] | 8.7/9.6[1.8/2.2] | 8.7/9.6[1.8/2.2] |
| Airflow Hi-Lo | Dry | CFM | 710-530 | 710-530 | 990-780 | 990-780 |
| | Wet | CFM | 640-480 | 640-480 | 890-700 | 890-700 |
| Sound level Hi-Lo | | dB(A) | 43-35 | 43-35 | 46-41 | 46-41 |
| Cond. drain connection OD | | | 1 | 1 | 1 | 1 |
| Dimensions | W | in. | 55-1/8 | | 66-5/32 | |
| | D | in. | 9-1/4 | | | |
| | H | in. | 13-3/8 | | | |
| Weight | | in. | 57 | 57 | 66 | 66 |
| OUTDOOR UNIT MODELS | | lb | PUH18EK | PUH24EK | PHU30EK | PUH36EK |
| External finish | | | Munsell 5Y 7/1 | | | |
| Power supply | | | 208/230,1,60 | | | |
| Max.fuse size (time dalay) | | V,phase,Hz | 20 | 20 | 30 | 30 |
| Min.ampacity | | A | 16 | 16 | 20 | 22 |
| Fan motor | | A | 0.75 | 0.65+0.65 | 0.75+0.75 | 0.75+0.75 |
| Compressor | Model (type) | F.L.A. | RH247NAB | NH33NBD | NH41NAD | NH47ND |
| | | | 12 | 11.5 | 14.0 | 17.5 |
| | | R.L.A. | 37 | 54 | 73 | 87 |
| Crankcase heater | | L.R.A. | 0.11/0.12[23/28] | 0.16/0.17[33/39] | 0.16/0.17[33/39] | 0.16/0.17[33/39] |
| Refrigerant control | | A(W) | Capillary tube | | | |
| Defrost method | | | Reverse cycle | | | |
| Sound level | | dB(A) | 53 | 55 | 55 | |
| Dimensions | W | | 34-1/4 | | 38-3/16 | 38-3/16 |
| | D | in. | 11-5/8 | | 13-9/16 | 13-9/16 |
| | H | in. | 33-1/2 | 49-9/16 | 49-9/16 | 49-9/16 |
| Weight | | in. | 131 | 202 | 245 | 246 |
| REMOTE CONTROLLER | | lb | With indoor unit | | | |
| Control voltage (by built-in transformer) | | | Indoor unit-remote controller:DC12V. Indoor unit-outdoor unit:DC12V | | | |
| REFRIGERANT PIPING | | | Not supplied(optional parts) | | | |
| Pipe size | Liquid | | 3/8 | | 1/2 | 1/2 |
| | Gas | in. | 5/8 | | 3/4 | 3/4 |
| Connection | Indoors | in. | Flared | | | |
| method | Outdoors | | Flared | | | |
| Between the indoor | Height difference | ft | 130 | 164 | | 164 |
| & outdoor units | Piping length | ft | 130 | 164 | | 164 |

NOTES : *1.Rating conditions (cooling)-indoor : 80˚FDB,67˚FWB outdoor : 95˚FDB,75˚FWB.
(heating)-indoor : 70˚FDB,60˚FWB outdoor : 47˚FDB,43˚FWB.
*2.Rating conditions (heating)-indoor : 70˚FDB,60˚FWB outdoor : 17˚FDB,15˚FWB.
*3.Heating capacity and power consumption in [ ] includes heater operation at 208/230V.

**Operating range**

| | | Indoor intake air temperature | Outdoor intake air temperature |
|---|---|---|---|
| Cooling | Maximum | 95˚FDB,71˚FWB | 115˚FDB |
| | Minimum | 67˚FDB,57˚FWB | 0˚FDB |
| Heating | Maximum | 80˚FDB,67˚FWB | 75˚FDB,65˚FWB |
| | Minimum | 70˚FDB,68˚FWB | 17˚FDB,15˚FWB |

# 3 DATA

## MODELS : PKH18/24/30/36FK

## 1. PERFORMANS DATA

### 1) COOLING CAPACITY

| Models | Models | | Outdoor intake air DB temperature(˚F) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airflow (CFM) / B.F | IWB (˚F) | 75 | | | 85 | | | 95 | | | 105 | | | 115 | | |
| | | | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC |
| PKH18FK | 710 / 0.16 | 71 | 21.0 | 14.4 | 1.56 | 20.2 | 13.9 | 1.69 | 19.4 | 13.3 | 1.84 | 18.5 | 12.7 | 1.99 | 17.6 | 12.1 | 2.15 |
| | | 67 | 19.5 | 16.0 | 1.52 | 18.8 | 15.4 | 1.65 | 18.0 | 14.8 | 1.79 | 17.1 | 14.0 | 1.93 | 16.3 | 13.4 | 2.07 |
| | | 63 | 18.2 | 17.4 | 1.49 | 17.5 | 16.7 | 1.61 | 16.8 | 16.0 | 1.74 | 15.9 | 15.2 | 1.88 | 15.1 | 14.4 | 2.01 |
| | DB 75°F (50%RH) | 62.5 | 18.1 | 15.5 | 1.49 | 17.4 | 14.9 | 1.61 | 16.6 | 14.3 | 1.74 | 15.8 | 13.6 | 1.87 | 15.0 | 12.9 | 2.00 |
| | DB 72°F (50%RH) | 60 | 17.2 | 15.1 | 1.47 | 16.6 | 14.5 | 1.58 | 15.8 | 13.8 | 1.70 | 15.0 | 13.1 | 1.84 | 14.2 | 12.4 | 1.96 |
| | DB 70°F (50%RH) | 59 | 16.8 | 14.5 | 1.46 | 16.2 | 14.0 | 1.57 | 15.5 | 13.4 | 1.69 | 14.6 | 12.6 | 1.83 | 13.9 | 12.0 | 1.94 |
| PKH24FK | 710 / 0.16 | 71 | 27.9 | 16.1 | 2.05 | 26.9 | 15.5 | 2.23 | 25.8 | 14.9 | 2.43 | 24.6 | 14.2 | 2.63 | 23.4 | 13.5 | 2.84 |
| | | 67 | 26.1 | 18.5 | 2.01 | 25.1 | 17.8 | 2.18 | 24.0 | 17.0 | 2.36 | 22.9 | 16.3 | 2.55 | 21.7 | 15.4 | 2.73 |
| | | 63 | 24.3 | 20.5 | 1.97 | 23.4 | 19.7 | 2.12 | 22.4 | 18.9 | 2.30 | 21.3 | 18.0 | 2.47 | 20.1 | 17.0 | 2.65 |
| | DB 75°F (50%RH) | 62.5 | 24.1 | 18.0 | 1.96 | 23.2 | 17.4 | 2.12 | 22.2 | 16.6 | 2.29 | 21.1 | 15.8 | 2.47 | 19.9 | 14.9 | 2.64 |
| | DB 72°F (50%RH) | 60 | 23.0 | 17.6 | 1.94 | 22.1 | 16.9 | 2.09 | 21.1 | 16.2 | 2.25 | 20.1 | 15.4 | 2.41 | 18.9 | 14.5 | 2.58 |
| | DB 70°F (50%RH) | 59 | 22.5 | 17.0 | 1.93 | 21.7 | 16.4 | 2.07 | 20.7 | 15.6 | 2.24 | 19.7 | 14.9 | 2.39 | 18.5 | 14.0 | 2.56 |
| PKH30FK | 990 / 0.15 | 71 | 34.9 | 21.5 | 2.72 | 33.7 | 20.8 | 2.95 | 32.3 | 19.9 | 3.21 | 30.8 | 19.0 | 3.48 | 29.3 | 18.1 | 3.75 |
| | | 67 | 32.6 | 24.5 | 2.66 | 31.4 | 23.6 | 2.88 | 30.0 | 22.5 | 3.12 | 28.6 | 21.5 | 3.37 | 27.1 | 20.3 | 3.61 |
| | | 63 | 30.4 | 26.9 | 2.60 | 29.2 | 25.8 | 2.81 | 27.9 | 24.6 | 3.04 | 26.6 | 23.5 | 3.27 | 25.1 | 22.2 | 3.50 |
| | DB 75°F (50%RH) | 62.5 | 30.2 | 23.8 | 2.59 | 29.0 | 22.9 | 2.80 | 27.7 | 21.9 | 3.03 | 26.3 | 20.7 | 3.26 | 24.9 | 19.6 | 3.49 |
| | DB 72°F (50%RH) | 60 | 28.8 | 23.2 | 2.57 | 27.6 | 22.2 | 2.77 | 26.3 | 21.2 | 2.99 | 24.9 | 20.1 | 3.21 | 23.5 | 18.9 | 3.43 |
| | DB 70°F (50%RH) | 59 | 28.2 | 22.4 | 2.56 | 27.0 | 21.5 | 2.76 | 25.7 | 20.4 | 2.98 | 24.4 | 19.4 | 3.19 | 22.9 | 18.2 | 3.41 |
| PKH36FK | 990 / 0.14 | 71 | 39.8 | 23.0 | 3.00 | 38.4 | 22.1 | 3.25 | 36.8 | 21.2 | 3.54 | 35.1 | 20.2 | 3.83 | 33.4 | 19.3 | 4.13 |
| | | 67 | 37.1 | 26.3 | 2.93 | 35.7 | 25.3 | 3.17 | 34.2 | 24.3 | 3.44 | 32.6 | 23.1 | 3.71 | 30.9 | 21.9 | 3.98 |
| | | 63 | 34.7 | 29.3 | 2.87 | 33.3 | 28.1 | 3.10 | 31.9 | 26.9 | 3.35 | 30.3 | 25.6 | 3.61 | 28.7 | 24.2 | 3.86 |
| | DB 75°F (50%RH) | 62.5 | 34.4 | 25.8 | 2.86 | 33.1 | 24.8 | 3.09 | 31.6 | 23.7 | 3.34 | 30.0 | 22.5 | 3.59 | 28.4 | 21.3 | 3.85 |
| | DB 72°F (50%RH) | 60 | 32.8 | 25.1 | 2.82 | 31.5 | 24.1 | 3.04 | 30.1 | 23.0 | 3.28 | 28.5 | 21.8 | 3.52 | 26.9 | 20.6 | 3.76 |
| | DB 70°F (50%RH) | 59 | 32.2 | 24.3 | 2.81 | 30.8 | 23.2 | 3.03 | 29.5 | 22.3 | 3.26 | 27.9 | 21.0 | 3.50 | 26.4 | 19.9 | 3.73 |

Notes 1. B.F. : Bypass Factor, IWB : Intake air wet-bulb temperature
TC : Total Capacity (x10$^3$ Btu/h), SHC : Sensible Heat Capacity (x10$^3$ Btu/h)
TPC : Total Power Consumption (kW)
2. SHC is based on 80˚FDB of indoor intake air temperature.
3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

| MODEL | Refrigerant piping length (one way) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 25ft | 40ft | 55ft | 70ft | 85ft | 100ft | 115ft | 130ft | 150ft | 164ft |
| PKH18FK | 1.0 | 0.992 | 0.983 | 0.978 | 0.966 | 0.959 | 0.950 | 0.945 | — | — |
| PKH24FK | 1.0 | 0.981 | 0.968 | 0.952 | 0.940 | 0.925 | 0.913 | 0.900 | 0.886 | 0.874 |
| PKH30FK | 1.0 | 0.981 | 0.968 | 0.952 | 0.940 | 0.925 | 0.913 | 0.900 | 0.886 | 0.874 |
| PKH36FK | 1.0 | 0.981 | 0.968 | 0.952 | 0.940 | 0.925 | 0.913 | 0.900 | 0.886 | 0.874 |

## 2) HEATING CAPACITY

| Models | Models | | Outdoor intake air WB temperature(˚F) | | | | | | | | | | | | Auxiliary heater (208V/230V) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airflow (CFM) | IWB (˚F) | 15 | | 25 | | 35 | | 45 | | 55 | | 65 | | | |
| | | | CA | PC | CA | PC | CA | PC | CA | PC | CA | PC | CA | PC | CA | PC |
| PKH18FK | 710 | 75 | 12.1 | 1.20 | 14.1 | 1.34 | 16.3 | 1.49 | 18.7 | 1.65 | 21.4 | 1.83 | 23.7 | 1.99 | 5.5 | 1.6 |
| | | 70 | 12.4 | 1.16 | 14.4 | 1.29 | 16.7 | 1.44 | 19.1 | 1.59 | 21.8 | 1.76 | 24.1 | 1.91 | | |
| | | 65 | 12.7 | 1.11 | 14.7 | 1.24 | 17.0 | 1.38 | 19.5 | 1.53 | 22.2 | 1.69 | 24.5 | 1.83 | 6.5 | 1.9 |
| PKH24FK | 710 | 75 | 16.3 | 1.82 | 18.9 | 2.03 | 21.9 | 2.27 | 25.2 | 2.51 | 28.8 | 2.77 | 32.8 | 3.01 | 5.5 | 1.6 |
| | | 70 | 16.6 | 1.76 | 19.4 | 1.96 | 22.4 | 2.19 | 25.7 | 2.42 | 29.3 | 2.67 | 33.3 | 2.90 | | |
| | | 65 | 17.0 | 1.69 | 19.8 | 1.89 | 22.9 | 2.10 | 26.2 | 2.32 | 29.9 | 2.56 | 33.9 | 2.78 | 6.5 | 1.9 |
| PKH30FK | 990 | 75 | 21.5 | 2.32 | 25.0 | 2.59 | 28.9 | 2.89 | 33.2 | 3.20 | 38.0 | 3.53 | 43.2 | 3.86 | 6.1 | 1.8 |
| | | 70 | 21.9 | 2.24 | 25.5 | 2.50 | 29.6 | 2.78 | 33.9 | 3.08 | 38.6 | 3.40 | 43.7 | 3.72 | | |
| | | 65 | 22.5 | 2.15 | 26.1 | 2.40 | 30.2 | 2.68 | 34.6 | 2.96 | 39.4 | 3.26 | 44.6 | 3.56 | 7.5 | 2.2 |
| PKH36FK | 990 | 75 | 24.7 | 2.71 | 28.7 | 3.04 | 33.3 | 3.39 | 38.2 | 3.75 | 43.7 | 4.14 | 49.6 | 4.49 | 6.1 | 1.8 |
| | | 70 | 25.3 | 2.62 | 29.4 | 2.93 | 34.1 | 3.26 | 39.0 | 3.61 | 44.5 | 3.98 | 50.4 | 4.28 | | |
| | | 65 | 25.9 | 2.53 | 30.1 | 2.82 | 34.8 | 3.14 | 39.9 | 3.47 | 45.4 | 3.83 | 51.3 | 4.14 | 7.5 | 2.2 |

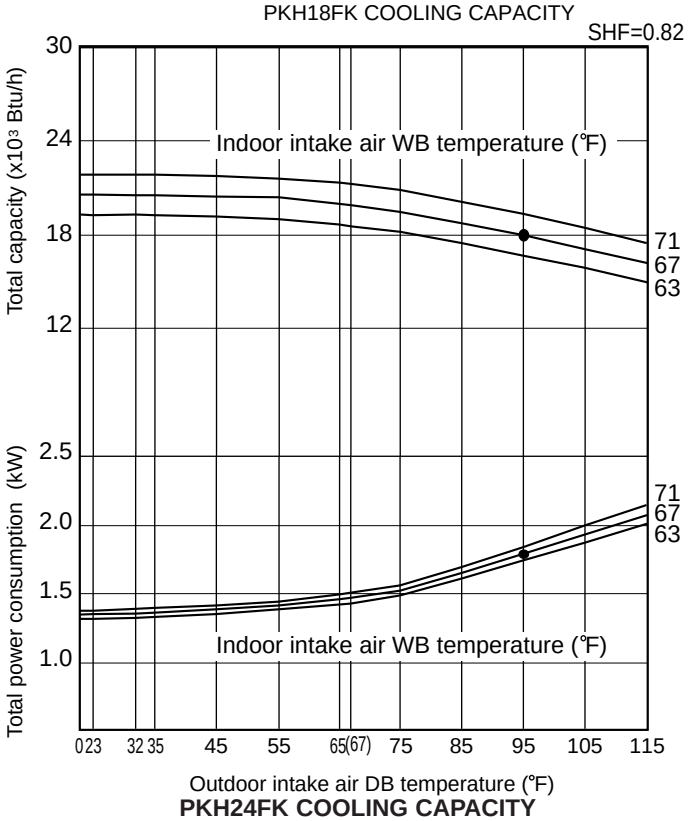
Notes 1. IDB : Intake air dry-bulb temperature
CA : Capacity ($x10^3$ Btu/h), PC : Power Consumption (kW)
2. When booster heater is "on", total capacity and total power consnmption should be added the figures described in booster heater colnmn.
•Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.
•Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.
3. Heating capacity correction factors.

| Models | Refrigerant piping length (one way) | | |
|---|---|---|---|
| | Less than 100ft | 100~130ft | 130~164ft |
| PKH18FK | 1.00 | 0.995 | 0.990 |
| PKH24FK | 1.00 | 0.995 | 0.990 |
| PKH30FK | 1.00 | 0.995 | 0.990 |
| PKH36FK | 1.00 | 0.995 | 0.990 |

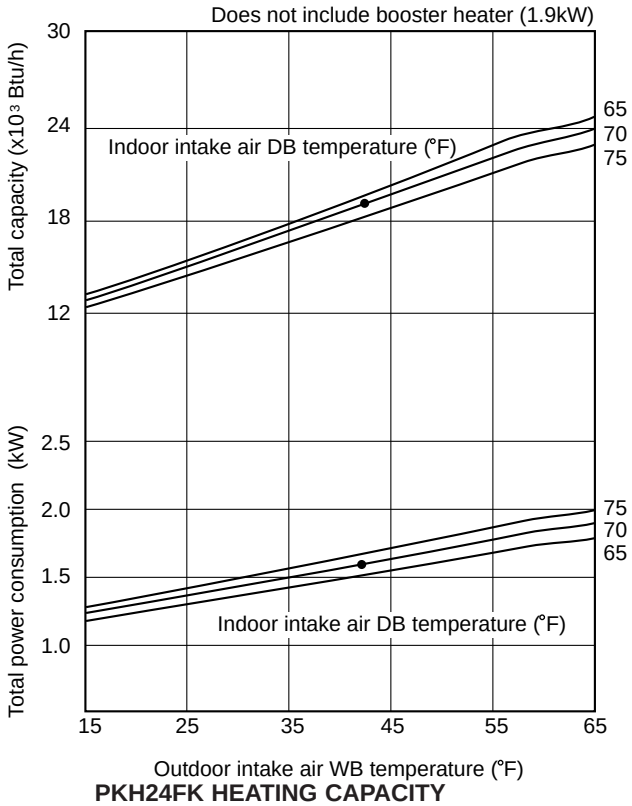
## 2. PERFORMANCE CURVE

NOTES : A point on the curve shows the reference point.

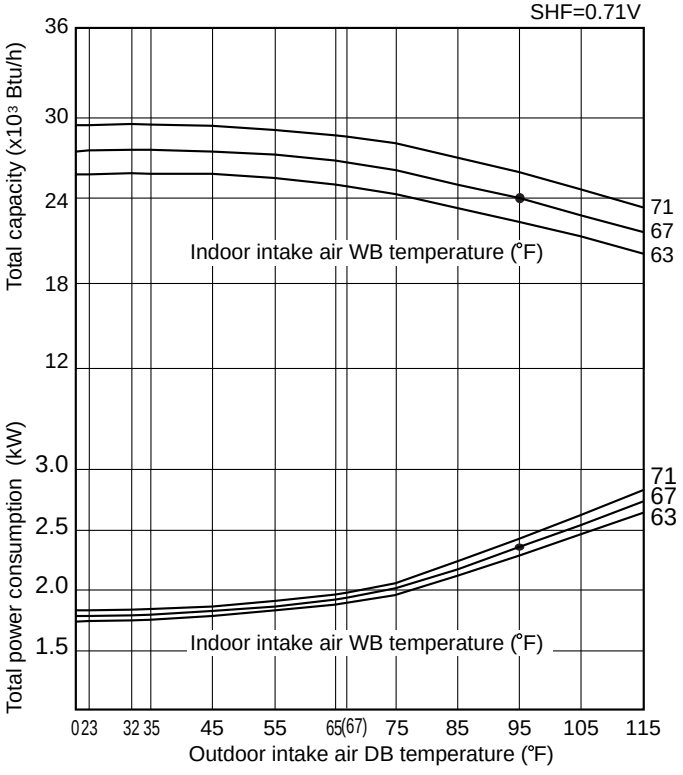
**PKH18FK COOLING CAPACITY**



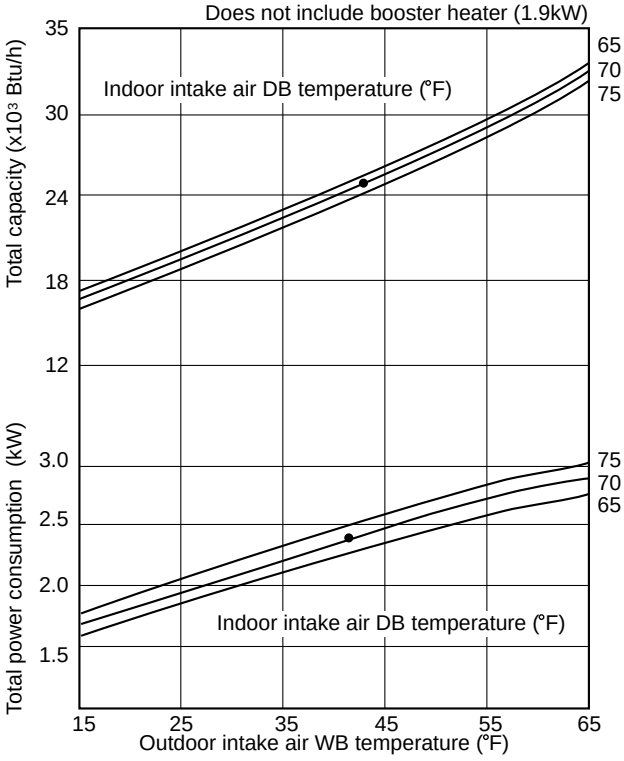

**PKH18FK HEATING CAPACITY**




**PKH24FK COOLING CAPACITY**

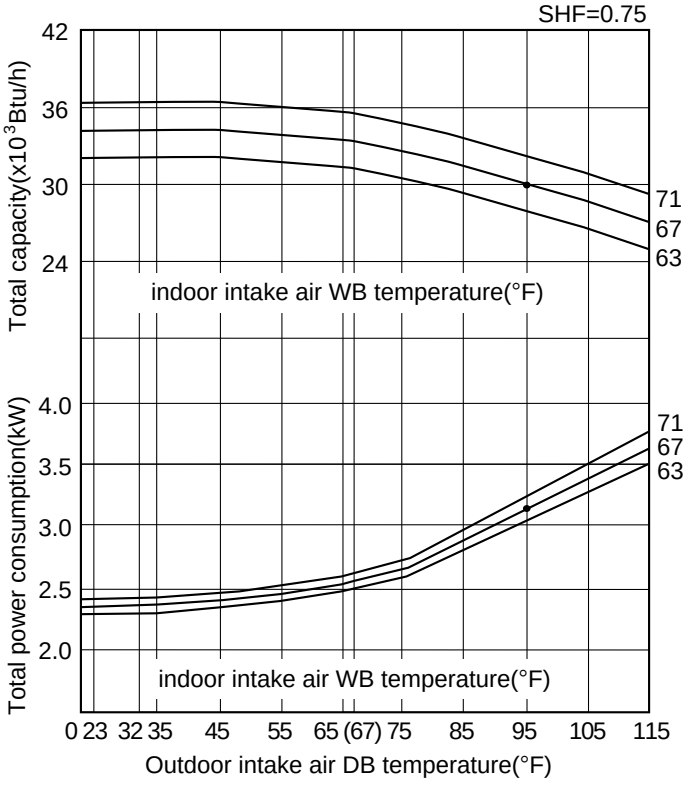



**PKH24FK HEATING CAPACITY**

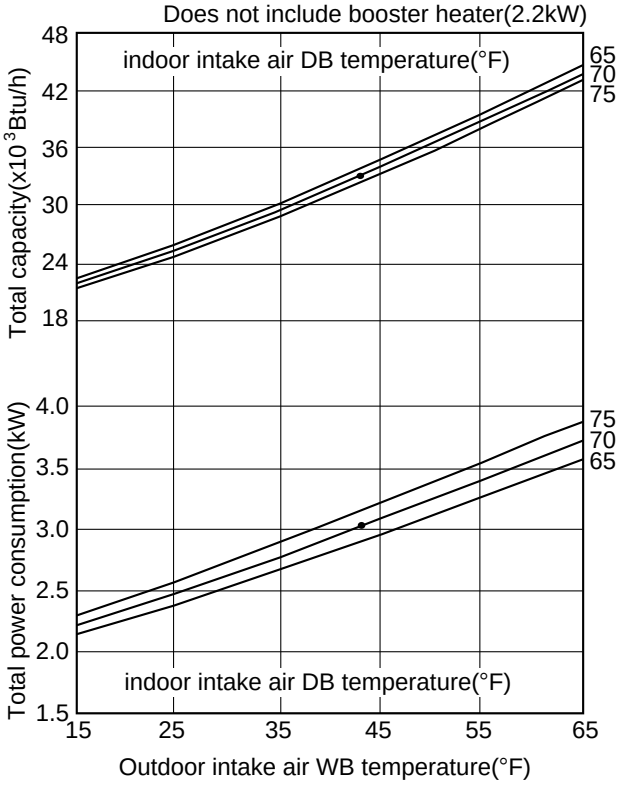


NOTES : A point on the curve shows the reference point.

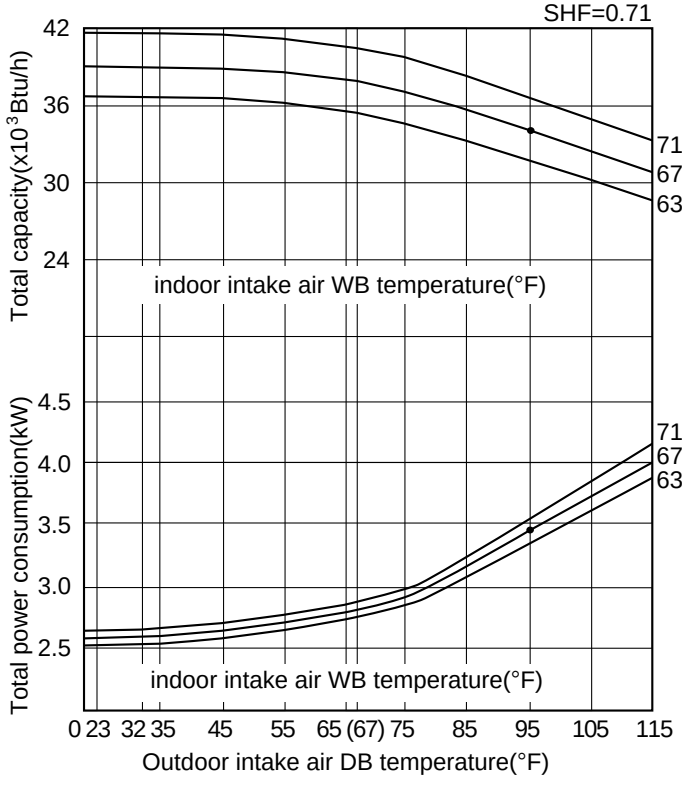
**PKH30FK COOLING CAPACITY**



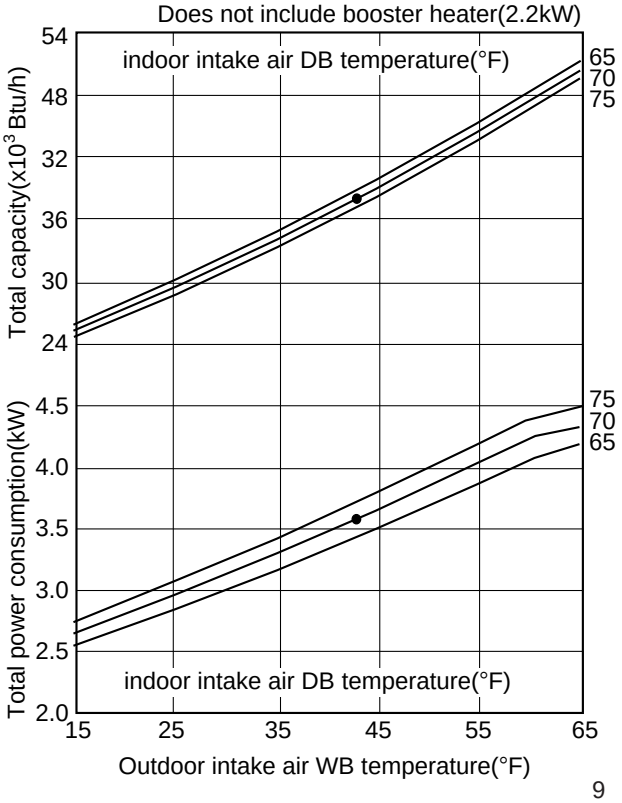

**PKH30FK HEATING CAPACITY**




**PKH36FK COOLING CAPACITY**




**PKH36FK HEATING CAPACITY**

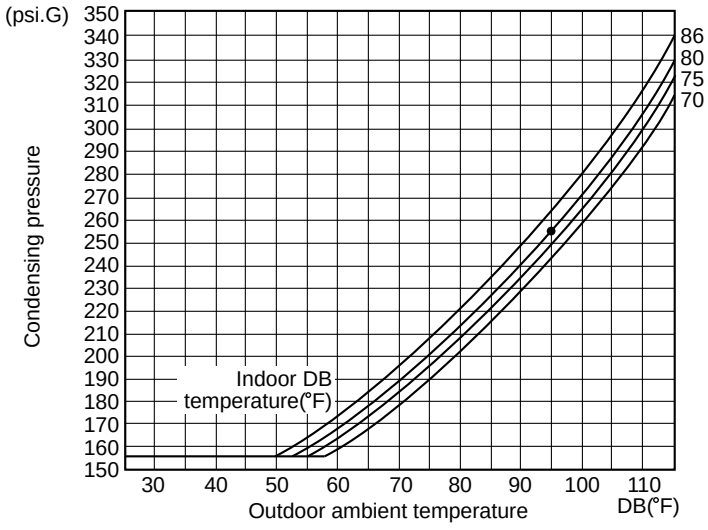


## 3. CONDENSING PRESSURE AND SUCTION PRESSURE

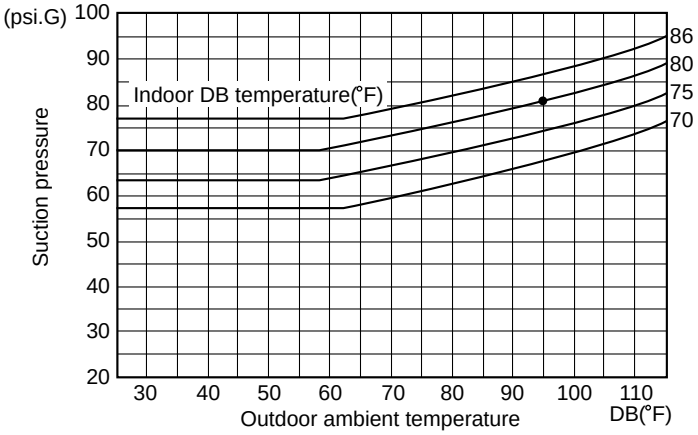
Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

### <Cooling mode>

**PKH18FK**



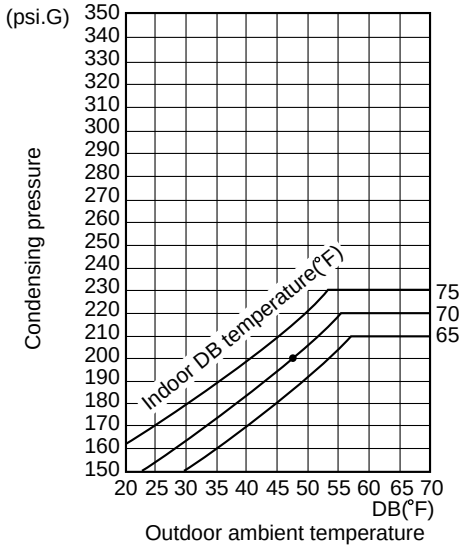

**PKH18FK**



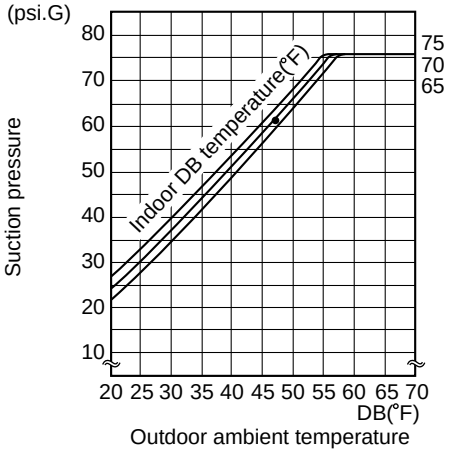

Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

### <Heating mode>

**PKH18FK**



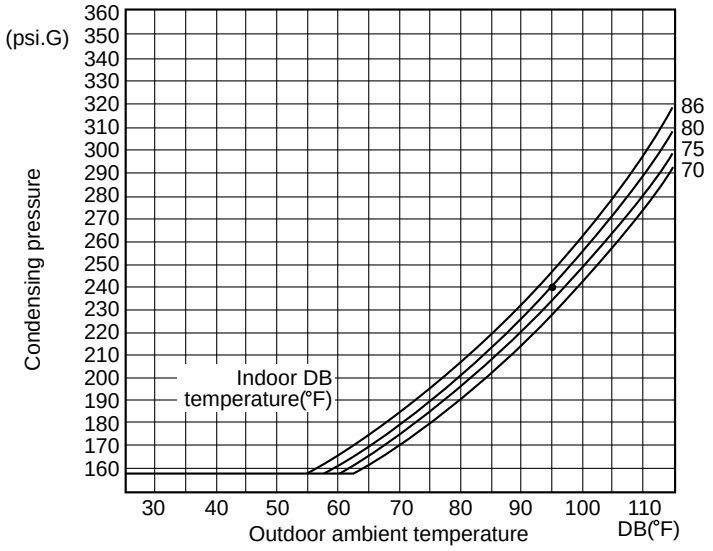

**PKH18FK**



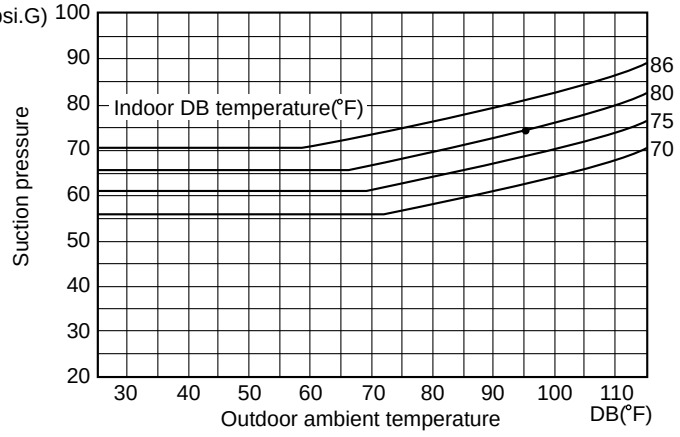
Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

**<Cooling mode>**

**PKH24FK**



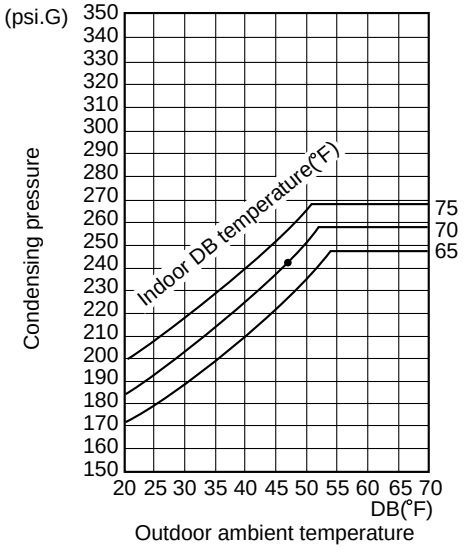

**PKH24FK**



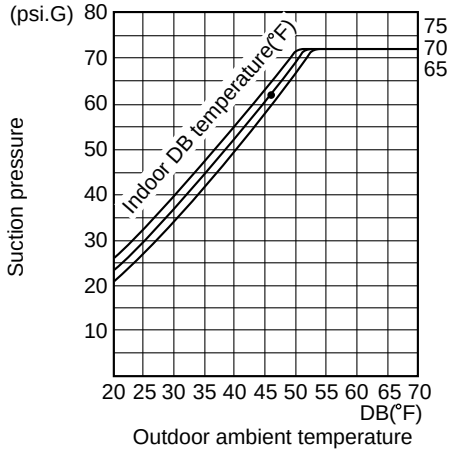

Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

**<Heating mode>**

**PKH24FK**



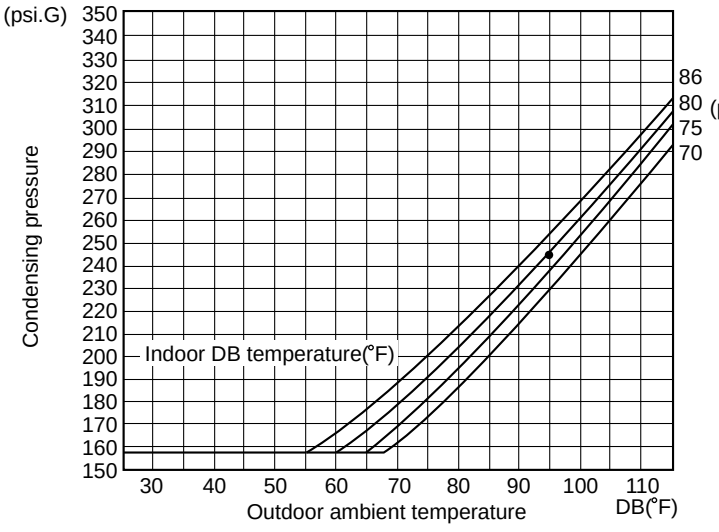

**PKH24FK**



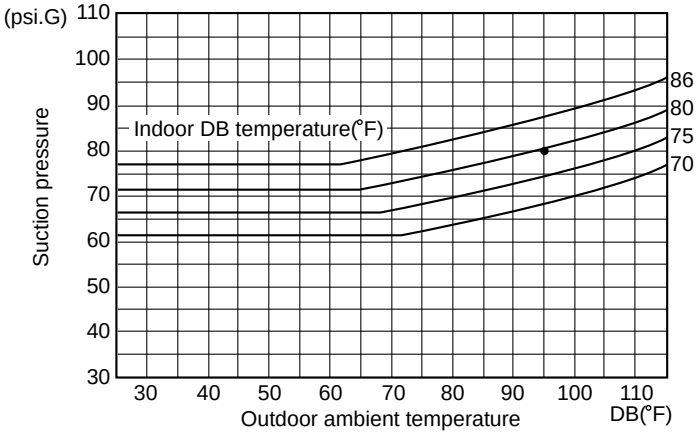
Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

**<Cooling mode>**

**PKH30FK**



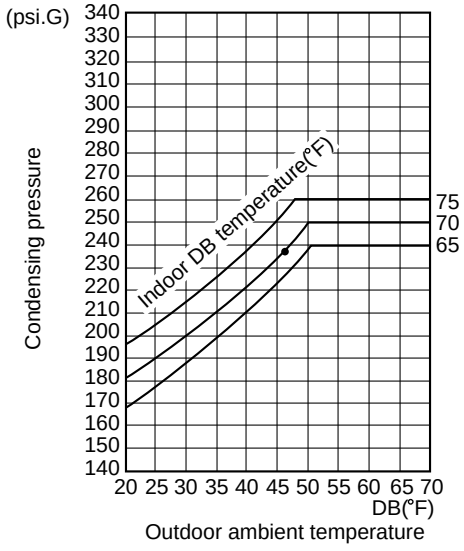

**PKH30FK**



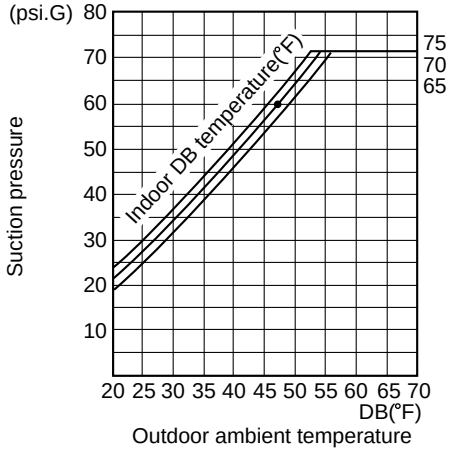

Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

**<Heating mode>**

**PKH30FK**



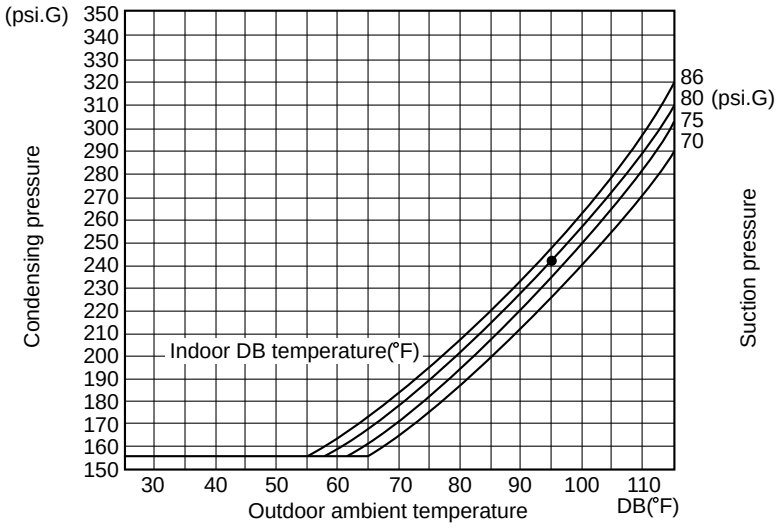

**PKH30FK**



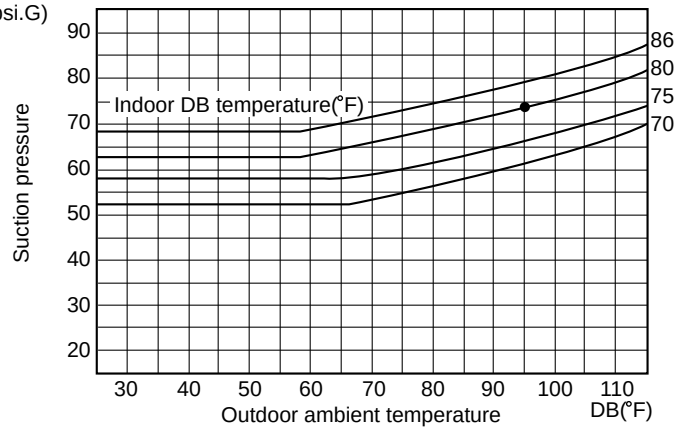
Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

**<Cooling mode>**

**PKH36FK**



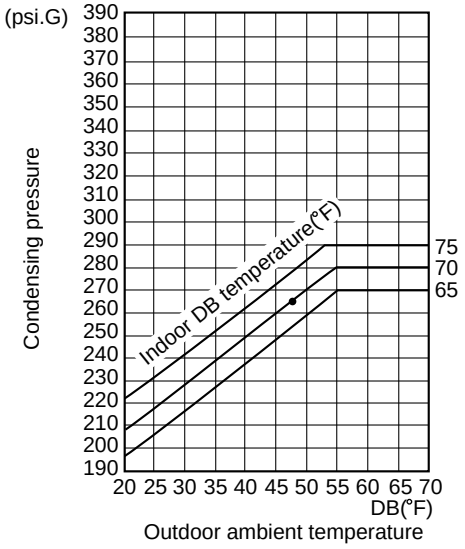

**PKH36FK**



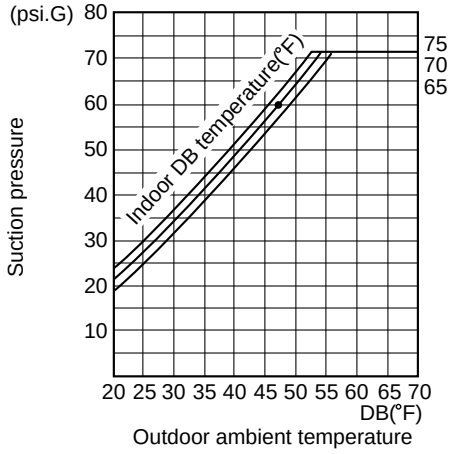

Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

**<Heating mode>**

**PKH36FK**




**PKH36FK**



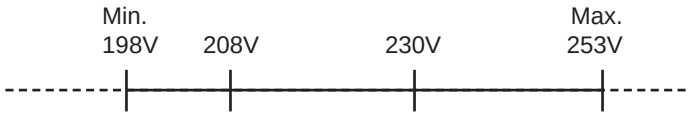
## 4. STANDARD OPERATION DATA

| Models | | | | PKH18FK | | PKH24FK | | PKH30FK | | PKH36FK | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating | Cooling | Heating | Cooling | Heating |
| Electrical circuit | Voltage | | V | 208/230 | 208/230 | 208/230 | 208/230 | 208/230 | 208/230 | 208/230 | 208/230 |
| | Frequency | | Hz | 60 | | 60 | | 60 | | 60 | |
| | Total input | | kW | 1.79 | 1.56 | 2.36 | 2.37 | 3.12 | 3.02 | 3.44 | 3.54 |
| | Indoor fan current | | A | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| | Booster heater current | | A | — | 7.6/8.4 | — | 7.6/8.4 | — | 7.6/8.4 | — | 8.7/9.6 |
| | Outdoor fan current | | A | 0.75 | 0.75 | 0.65+0.65 | 0.65+0.65 | 0.75+0.75 | 0.75+0.75 | 0.75+0.75 | 0.75+0.75 |
| | Comp. current | | A | 7.4/6.9 | 6.1/5.9 | 9.3/8.7 | 9.5/8.7 | 12.6/11.8 | 12.2/11.4 | 14.3/13.2 | 14.7/13.7 |
| Refrigerant circuit | Condensing pressure | | psi.G | 255 | 202 | 240 | 243 | 245 | 236 | 243 | 263 |
| | Suction pressure | | psi.G | 81 | 61 | 75 | 63 | 80 | 60 | 74 | 60 |
| | Discharge temperature | | ˚F | 182 | 126 | 158 | 149 | 158 | 159 | 160 | 170 |
| | Condensing temperature | | ˚F | 118 | 102 | 115 | 115 | 115 | 113 | 115 | 120 |
| | Suction temperature | | ˚F | 66 | 34 | 46 | 35 | 49 | 32 | 45 | 33 |
| | Comp.shell bottom temperature | | ˚F | 171 | 111 | 141 | 126 | 138 | 130 | 142 | 148 |
| | Ref. pipe length | | ft | | | 25 | | 25 | | 25 | |
| | Refrigerant charge | | — | 5 lbs 8 oz | | 9 lbs 15 oz | | 10 lbs 2 oz | | 10 lbs 9 oz | |
| Indoor side | Intake air temperature | DB | ˚F | 80 | 70 | 80 | 70 | 80 | 70 | 80 | 70 |
| | | WB | ˚F | 67 | 60 | 67 | 60 | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | ˚F | 61 | 96 | 58 | 105 | 59 | 103 | 58 | 109 |
| | | WB | ˚F | 59 | 68 | 56 | 70 | 58 | 70 | 56 | 71 |
| | Fan speed | | r.p.m. | 1,490 | | 1,490 | | 1,490 | | 1,490 | |
| | Airflow (High) | | CFM | 710 | | 710 | | 990 | | 990 | |
| Outdoor side | Intake air temperature | DB | ˚F | 95 | 47 | 95 | 47 | 95 | 47 | 95 | 47 |
| | | WB | ˚F | 75 | 43 | 75 | 43 | 75 | 43 | 75 | 43 |
| | Fan speed upper/lower | | r.p.m. | 790 | | 750/750 | | 760/760 | | 760/760 | |
| | Airflow | | CFM | 1,590 | | 3,170 | | 3,350 | | 3,350 | |
| Capacity | | | Btu/h | 18,000 | 18,600 | 24,000 | 25,000 | 30,000 | 33,000 | 34,100 | 38,000 |
| SHF | | | — | 0.82 | — | 0.71 | — | 0.75 | — | 0.71 | — |

## 5. OPERATING RANGE

### 1) POWER SUPPLY

1 Phase 60Hz 208/230V
Guaranteed voltage range




### 2) OPERATION

| Function | Air intake temperature / Condition | Indoor | | Outdoor | |
|---|---|---|---|---|---|
| | | DB(˚F) | WB(˚F) | DB(˚F) | WB(˚F) |
| Cooling | Standard temperature | 80 | 67 | 95 | 75 |
| | Maximum temperature | 95 | 71 | 115 | — |
| | MInimum temperature | 67 | 57 | 23 | — |
| | Maximum humidity | 80 | 75 | 80 | 75 |
| Heating | Standard temperature | 70 | 60 | 47 | 43 |
| | Maximum temperature | 80 | 67 | 75 | 65 |
| | MInimum temperature | 70 | 60 | 17 | 15 |

## 6. OUTLET AIR SPEED AND COVERAGE RANGE

| Model | Airflow (CFM) | Air speed (ft/sec) | Coverage range(ft) |
|---|---|---|---|
| PKH18FK | 710 | 16.1 | 41 |
| PKH24FK | 710 | 16.1 | 41 |
| PKH30FK | 990 | 17.7 | 50 |
| PKH36FK | 990 | 17.7 | 50 |

The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High notch position. The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

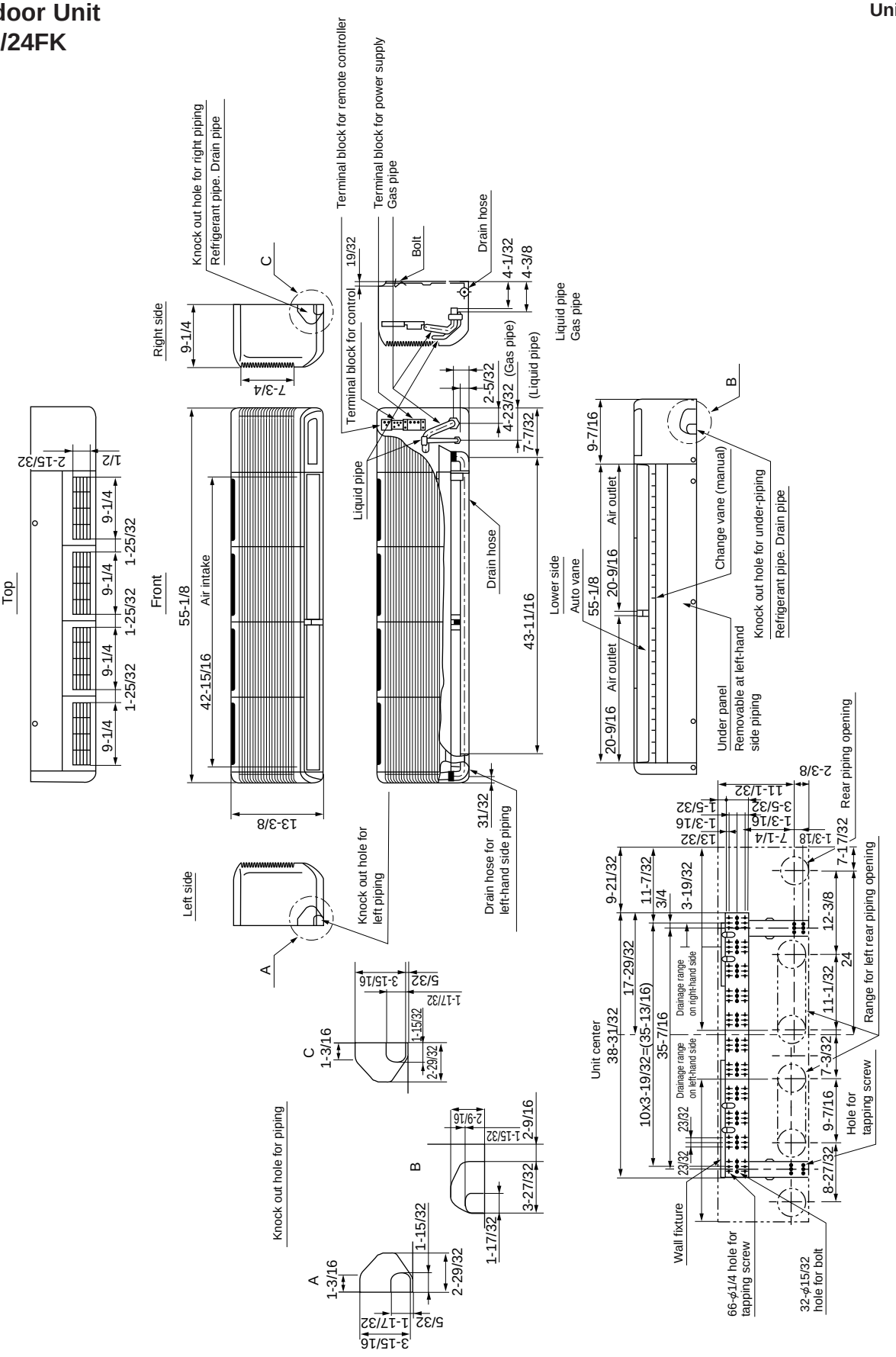
## 7. ADDITIONAL REFRIGERANT CHARGE (R-22(oz))

| Model | Outdoor unit precharged (up to 100ft) | Refrigerant piping length (one way) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 25ft | 40ft | 55ft | 70ft | 85ft | 100ft | 115ft | 130ft | 150ft | 164ft |
| PKH18FK | 5 lbs 8 oz | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | — | — |
| PKH24FK | 9 lbs 15 oz | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 7 | 9 |
| PKH30FK | 10 lbs 2 oz | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 16 | 20 |
| PKH36FK | 10 lbs 9 oz | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 10 | 16 | 20 |

# 4 OUTLINES AND DIMENSIONS

## 4.1. Indoor Unit
## PKH18/24FK

**Unit : mm**



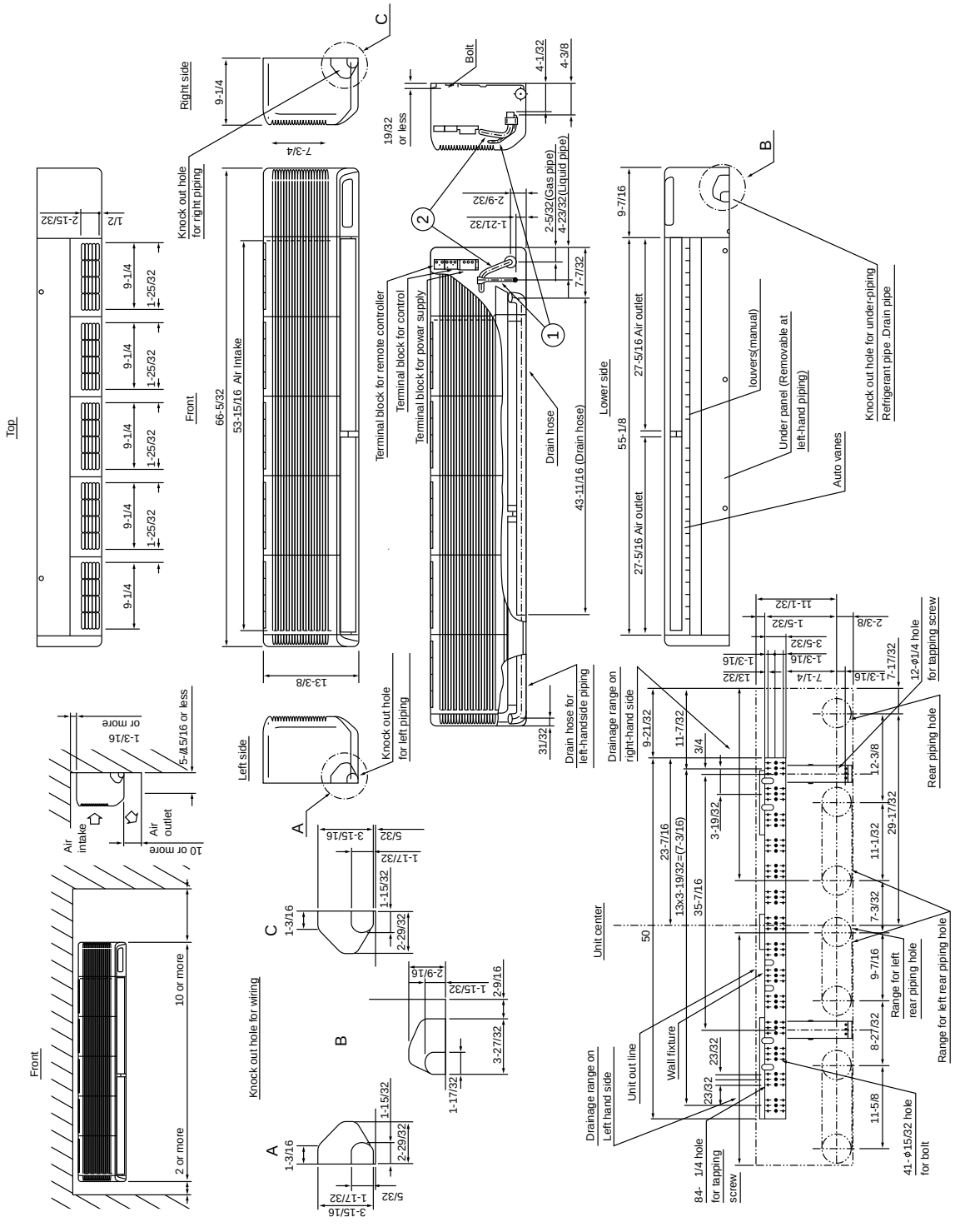
## PKH 30/36FK

**Unit : mm(inch)**

| | |
|---|---|
| ① Liquid pipe | 1/2F |
| ② Gas pipe | 3/4F |

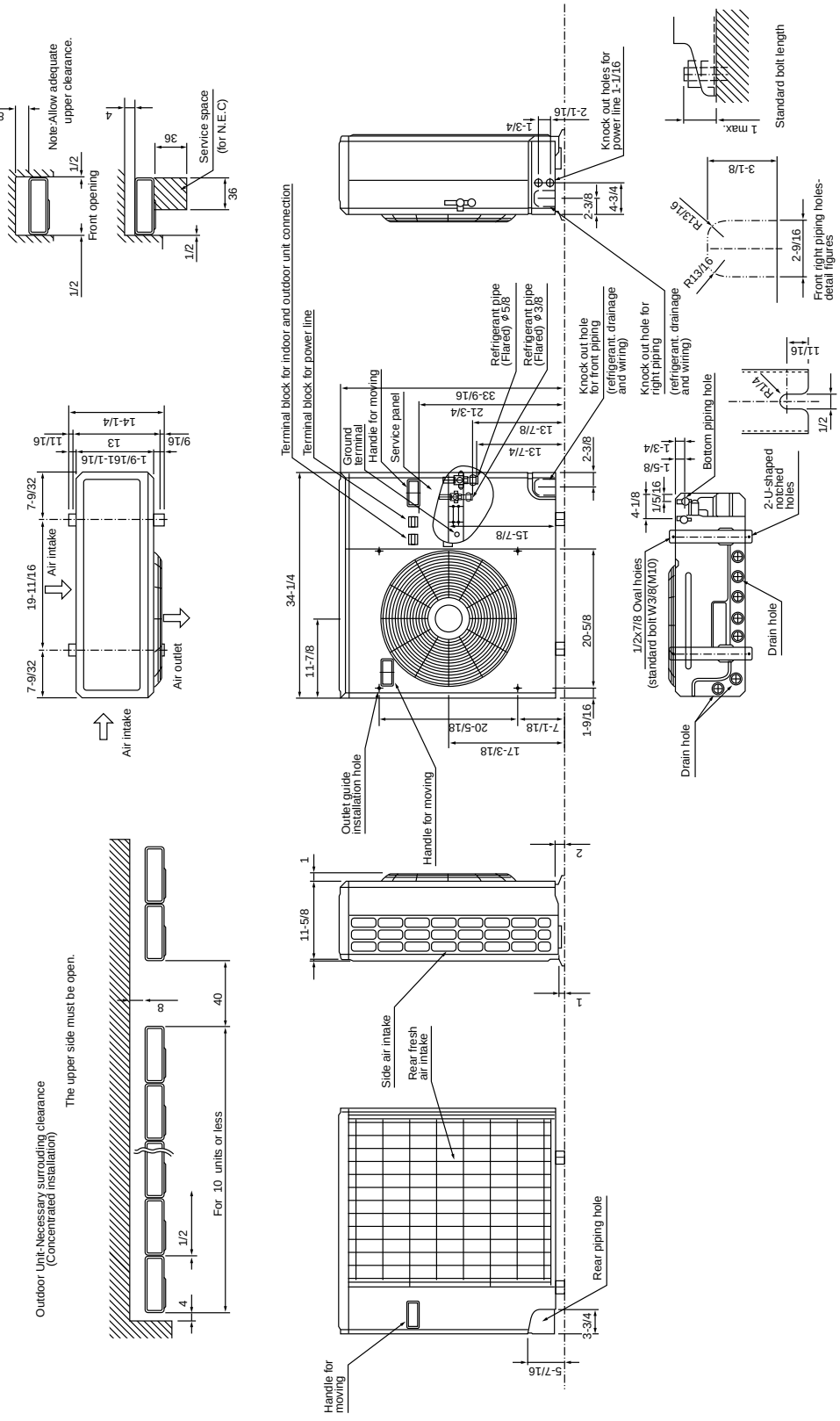
| Sleeve ※1 | Through hole |
|---|---|
| φ 3-1/2 | φ3-1/2~ φ 4 |

※1 Sleeves are available on the market.



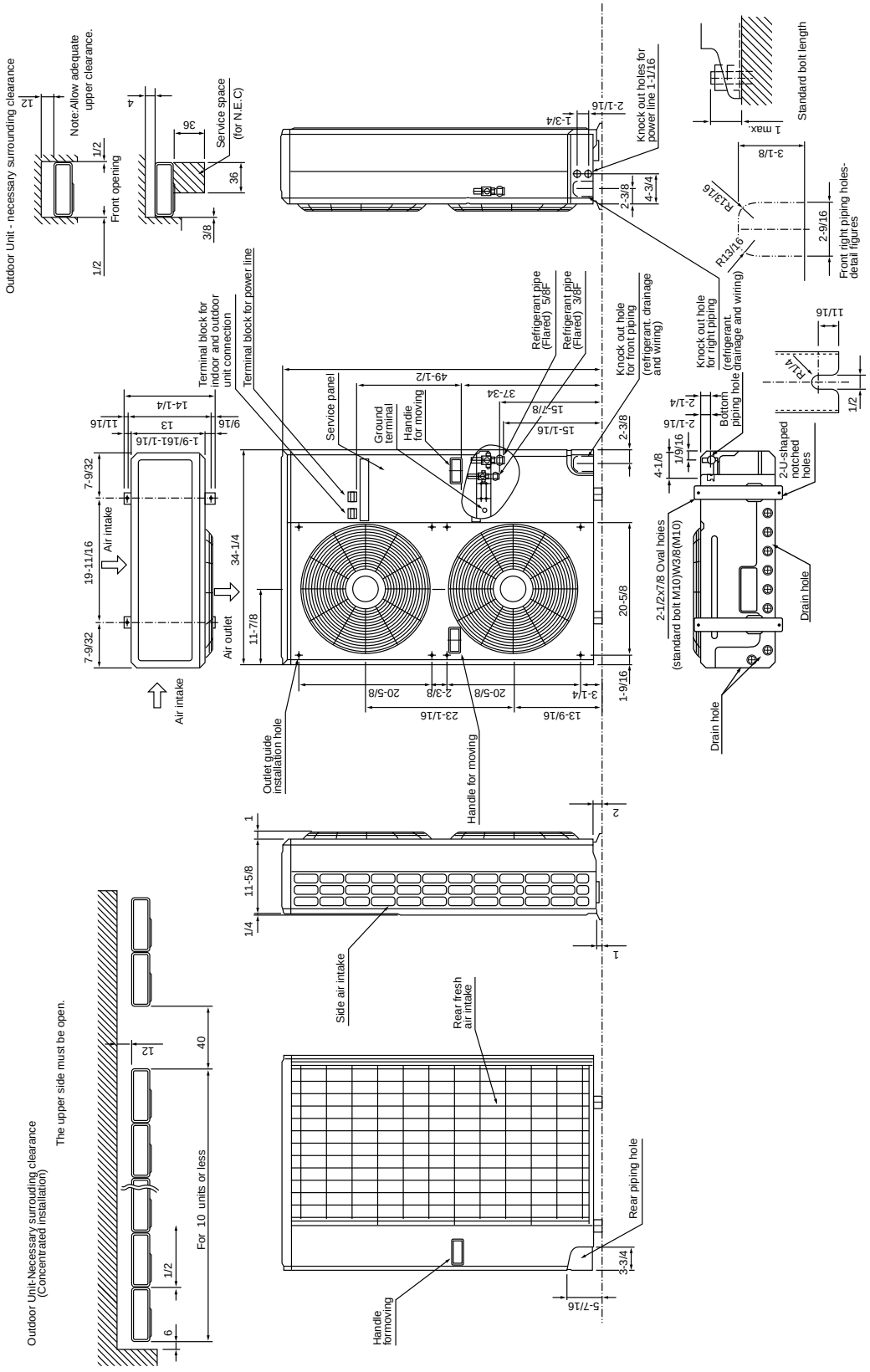
## 4.2. Outdoor Unit PUH18EK

**Unit : mm**


Note:Allow adequate upper clearance.
Front opening
Service space (for N.E.C)
Air intake
Air outlet
Terminal block for indoor and outdoor unit connection
Terminal block for power line
Ground terminal
Handle for moving
Service panel
Refrigerant pipe (Flared) φ5/8
Refrigerant pipe (Flared) φ3/8
Knock out hole for front piping (refrigerant, drainage and wiring)
Knock out hole for right piping (refrigerant, drainage and wiring)
Knock out holes for power line
Standard bolt length
Front right piping holes-detail figures
Bottom piping hole
2-U-shaped notched holes
1/2x7/8 Oval holes (standard bolt W3/8(M10)
Drain hole
Outlet guide installation hole
Handle for moving
Side air intake
Rear fresh air intake
Rear piping hole
Outdoor Unit-Necessary surrouding clearance (Concentrated installation)
The upper side must be open.
For 10 units or less

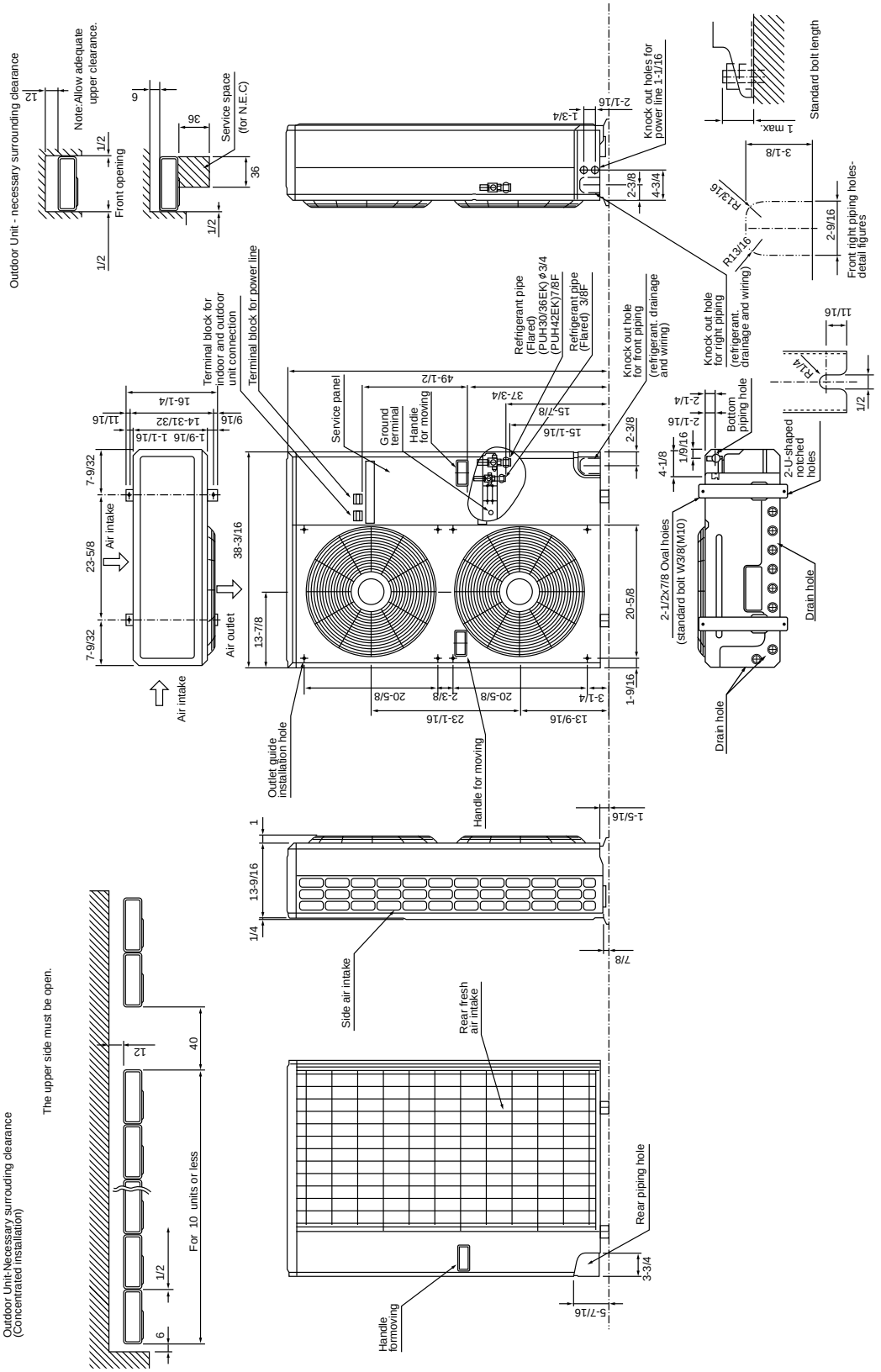
## Outdoor Unit PUH24EK

**Unit : mm**


Outdoor Unit - necessary surrounding clearance
Note:Allow adequate upper clearance.
Front opening
Service space (for N.E.C)
Standard bolt length
Knock out holes for power line 1-1/16
Terminal block for indoor and outdoor unit connection
Terminal block for power line
Refrigerant pipe (Flared) 5/8F
Refrigerant pipe (Flared) 3/8F
Knock out hole for front piping (refrigerant: drainage and wiring)
Knock out hole for right piping (refrigerant drainage and wiring)
Front right piping holes-detail figures
Service panel
Ground terminal
Handle for moving
Bottom piping hole
2-U-shaped notched holes
Air intake
Air outlet
2-1/2x7/8 Oval holes (standard bolt M10)W3/8(M10)
Drain hole
Outlet guide installation hole
Handle for moving
Side air intake
Rear fresh air intake
Rear piping hole
Handle formoving
Outdoor Unit-Necessary surrounding clearance (Concentrated installation)
The upper side must be open.
For 10 units or less

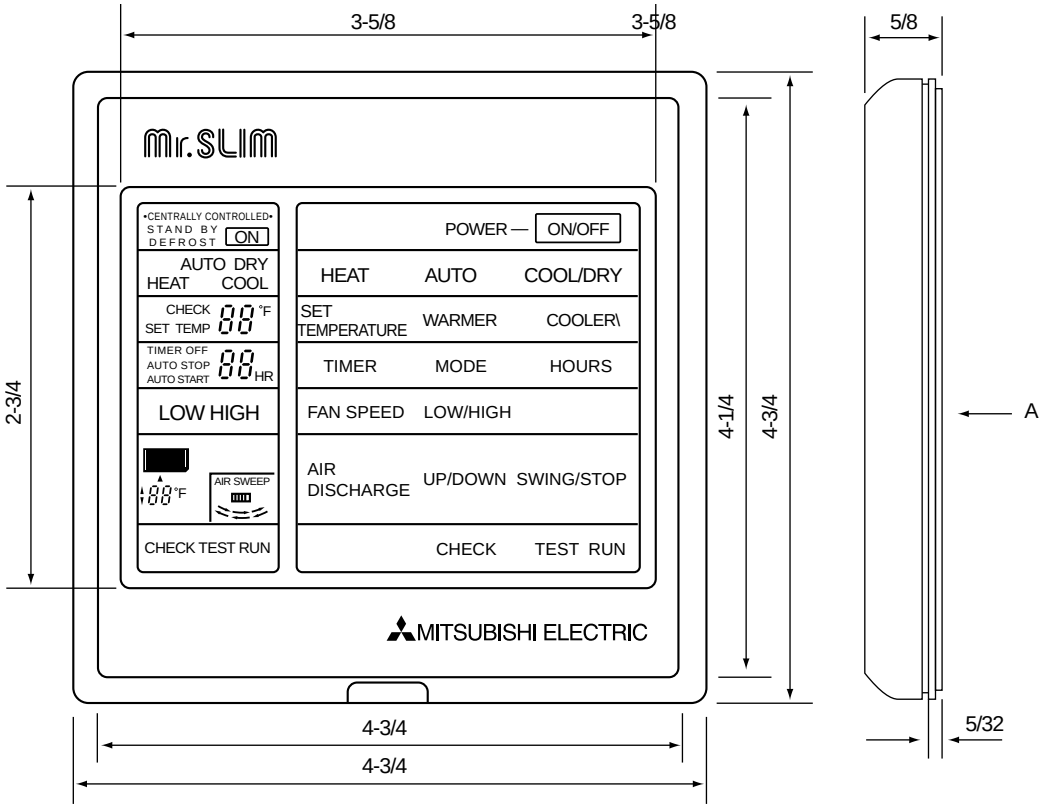
## Outdoor Unit PUH30/36EK

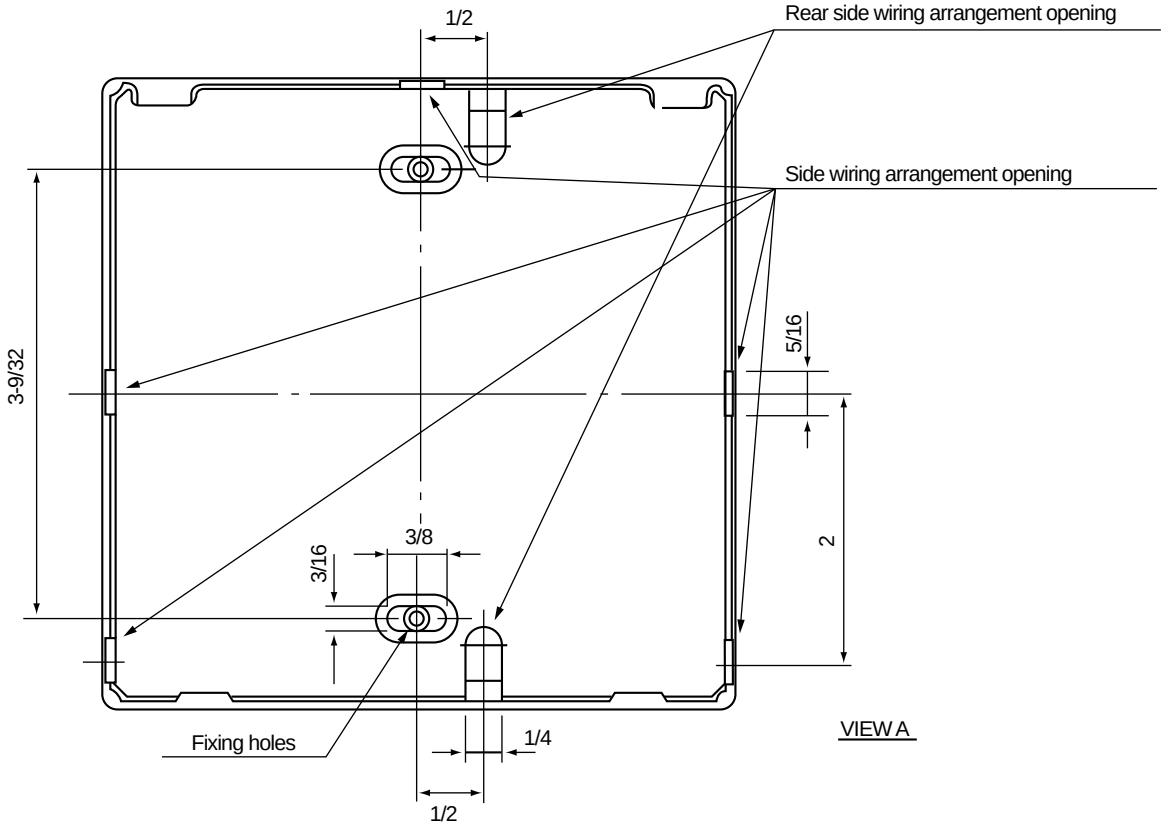
**Unit : mm**


Outdoor Unit - necessary surrounding clearance
Note:Allow adequate upper clearance.
Front opening
Service space (for N.E.C)
Standard bolt length
Knock out holes for power line 1-1/16
Front right piping holes-detail figures
Knock out hole for right piping (refrigerant. drainage and wiring)
Terminal block for indoor and outdoor unit connection
Terminal block for power line
Refrigerant pipe (Flared) (PUH30/36EK) ϕ3/4 (PUH42EK)7/8F
Refrigerant pipe (Flared) 3/8F
Knock out hole for front piping (refrigerant. drainage and wiring)
Service panel
Ground terminal
Handle for moving
Bottom piping hole
2-U-shaped notched holes
Air intake
Air outlet
Drain hole
2-1/2x7/8 Oval holes (standard bolt W3/8(M10)
Outlet guide installation hole
Handle for moving
Side air intake
Rear fresh air intake
Rear piping hole
Handle formoving
Outdoor Unit-Necessary surrouding clearance (Concentrated installation)
The upper side must be open.
For 10 units or less

## Remote controller (PKH series)

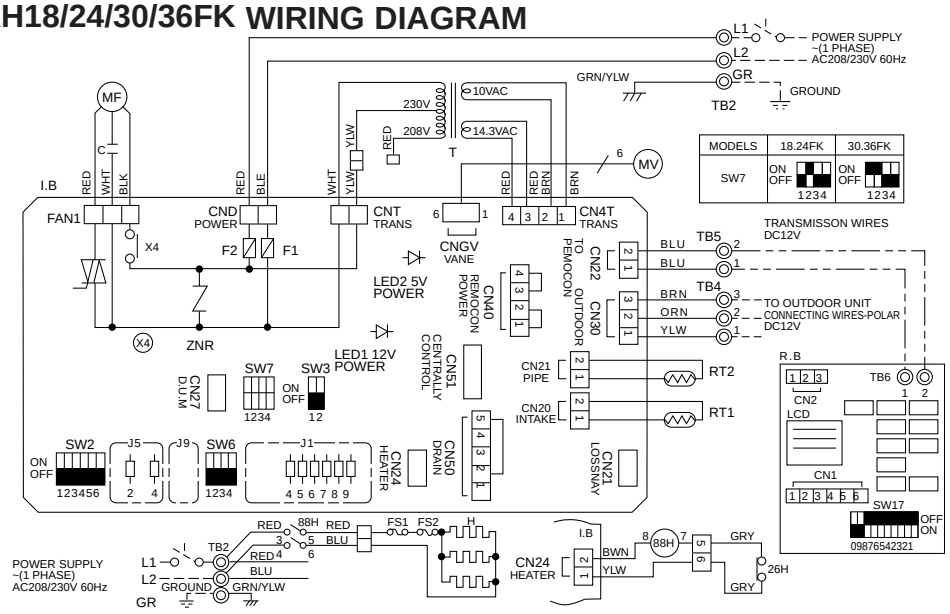
**Unit : mm**



# 5 WIRING DIAGRAM

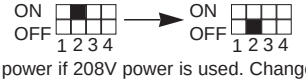
## MODELS PKH18/24/30/36FK WIRING DIAGRAM



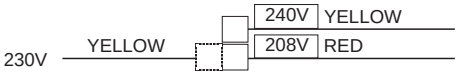

| SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|
| C | FAN MOTOR CAPACITOR | RT1 | ROOM TEMP. THERMISTOR (32°F / 15KΩ, 77°F / 5.4KΩ DETECT) |
| CN1<R.B> | PROGRAM TIMER CONNECTOR | | |
| CN2<R.B> | REMOTE SWITCH CONNECTOR | RT2 | INDOOR COIL THERMISTOR (32°F / 15KΩ, 77°F / 5.4KΩ DETECT) |
| CN21<I.B> | LOSSNAY CONNECTOR | | |
| CN27<I.B> | DRAIN LIFT-UP MECHANISM CONNECTOR | SW2<I.B> | ADDRESS SELECTOR |
| CN51<I.B> | CENTRALLY CONTROL CONNECTOR | SW3<I.B> | EMERGENCY OPERATION |
| F1,2<I.B> | FUSE (6A 250V) | SW6<I.B> | MODEL SELECTOR |
| FS1,2 | THERMAL FUSE <243°F / 18, 24FK : 10A. 30.36FK : 16A> | SW7<I.B> | MODEL SELECTOR |
| H | HEATER | SW17<I.B> | ADDRESS SELECTOR |
| I.B | INDOOR CONTROLLER BOARD | T | TRANSFORMER |
| J1 | MODE SELECTOR JUMPER RESISTORS | TB2 | POWER TERMINAL BLOCK |
| J5 | MODE SELECTOR JUMPER RESISTORS | TB4 | INDOOR / OUTDOOR CONNECTING LINE TERMINAL BLOCK |
| J9 | MODE SELECTOR JUMPER RESISTORS | TB5 | REMOTE CONTROLLER TERMINAL BLOCK |
| LCD<R.B> | LIQUID CRYSTAL DISPLAY | TB6 | TRANSMISSION LINE |
| LED1<I.B> | LED (DC 12V POWER) | X4<I.B> | FAN MOTOR RELAY |
| LED2<I.B> | LED (DC 5V POWER) | ZNR | VARISTOR |
| MF | FAN MOTOR | 26H | HEATER THERMAL SWITCH |
| MV | VANE MOTOR | 88H | HEATER CONTACTOR |
| R.B | REMOTE CONTROLLER BOARD | | |

**NOTES :**

1. Since the indoor fan motor (MF) is connected with 230V power, using 208V power will require a setting change of the dip switch (SW7<I.B>) on the indoor controller board as shown in fig : ※1.
   fig ※1 Indoor fan motor (MF) for 208V.




2. Since the indoor transformer (T) is connected with 230V power if 208V power is used. Change the wiring connection showing fig : ※2.
   fig ※2 When power supply is




3. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
4. Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers.
5. Symbols used in wiring diagram above are, : Connector, ◎ : Terminal block.
6. Emergency operation
   If remote controller or microcomputer fails but there is no other trouble, emergency operation is possible by setting dip switch (SW3<I.B>) on the indoor controller board.

[Check items]

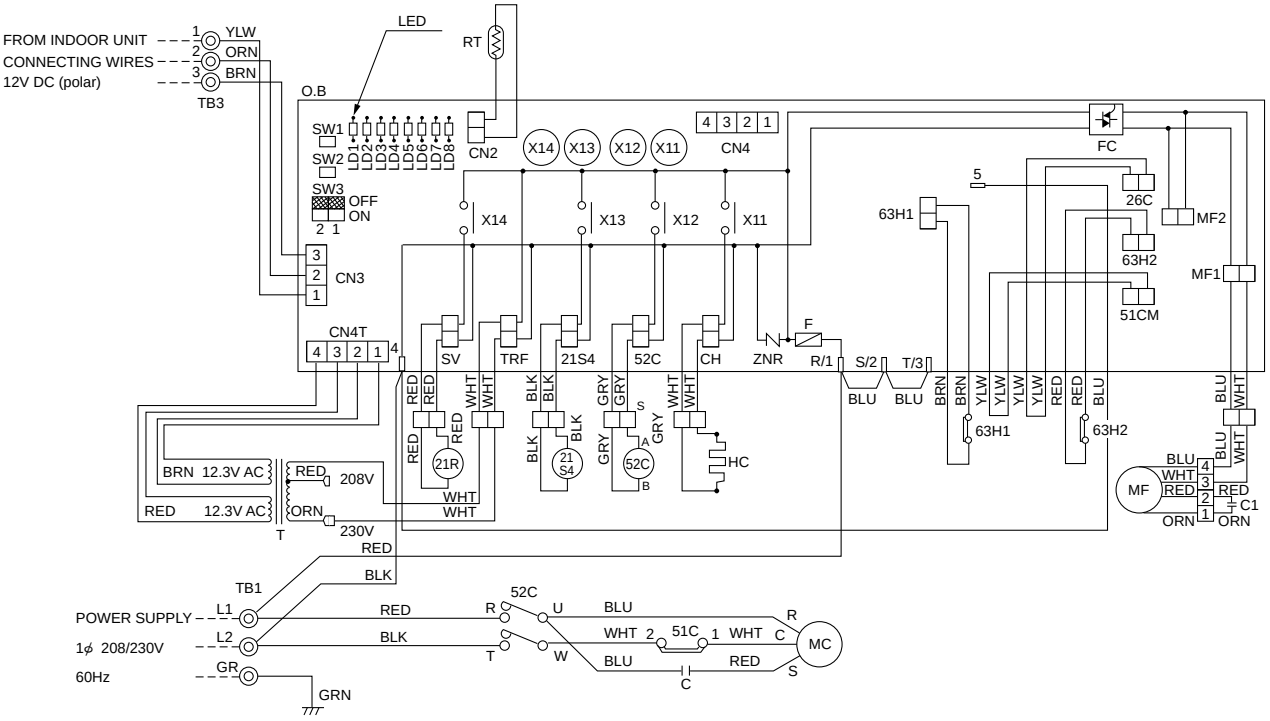
(1)Make sure that no other trouble exist the outdoor unit. Trouble with the outdoor unit prevents emergency operation.
   (If any trouble exists the outdoor unit error code "P8" will be displayed on the remote controller and the trouble position will be shown on the outdoor controller board LED. See electric wiring diagram of the outdoor unit for details.)
(2)Make sure that there is no trouble with the indoor fan.
   Emergency operation will be continuous operation mode due to power ON/OFF (ON/OFF with the remote controller is not possible).

[Emergency operation procedure]

(1)Set the dip switch (SW3<I.B>) on the indoor controller board to 1 on and 2 off for cooling and 1 - 2 on for heating.
(2)Turn on outdoor unit side circuit breaker, then indoor unit side circuit breaker.
(3)During emergency operation indoor fan runs at high speed but automatic vane remains stopped.
   If the air outlet is blocked up with the vane, Open it with your hands.
(4)Thermostat will not function. Cold air blows out for defrosting during heating thus do not operate defrosting for along time.
(5)Emergency cooling should be limited to 10 hours maximum.
(The indoor unit heat exchanger may freeze).
(6)After every operation, switch the fan connector to FAN1, and set all dip switches (SW3<I.B>) to OFF.

## MODELS PUH18EK WIRING DIAGRAM

| | | | | | |
|---|---|---|---|---|---|
| C | COMPRESSOR CAPACITOR | RT | OUTDOOR COIL THERMSTOR | X14<O.B> | BYPASS VALVE RELAY |
| C1 | FAN CAPACITOR | | <32˚F/15kΩ,77˚F/5.4kΩ> | ZNR<O.B> | VARISTOR |
| F<O.B> | FUSE<6A> | SW1•2•3<0.B> | SELECTOR<CHECK,SERVICE> | 21R | BYPASS VALVE COIL |
| FC<O.B> | FAN CONTROLLER | T | TRANSFORMER | 21S4 | R.V COIL |
| HC | CRANKCASE HEATER | TB1,3 | TERMINAL BLOCK | 51C | OVERCURRENT RELAY |
| LD1~LD8 | LED<CHECK,SERVICE> | X11<O.B> | CRANKCASE HEATER RELAY | 52C | CONTACTOR |
| MC | COMPRESSOR | X12<O.B> | COMPRESSOR RELAY | 63H1 | CONTROL HIGH PRESSURE SWITCH |
| MF | FAN MOTOR<INNER THERMOSTAT> | X13<O.B> | R.V RELAY | 63H2 | PROTECT HIGH PRESSURE SWITCH |
| O.B | OUTDOOR CONTROLLER BOARD | | | | |




Main function of LED(when both Nos.1 and 2 of SW3 are "OFF")

| LED NO. | Output display (light) | | Check display (flash) |
|---|---|---|---|
| LD1 | Compressor indoor command | | — |
| LD2 | Heating indoor command | | — |
| LD3 | 63H1 | ON | RT short/open |
| LD4 | Compressor | ON | 63H2 funcitons |
| LD5 | Outdoor fan | ON | — |
| LD6 | R.V.coil | ON | — |
| LD7 | Bypass valve | ON | RT overheat protection |
| LD8 | Crankcase heater | ON | Defective input |

How to use SW1 and 2

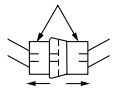
- Pressing SW1 erases the past check contents loaded on the microcomputer.
- The output display (light) remains during operation but pressing SW2 displays the past check contents in flashing mode. Pressing the switch again retums to output display (light).

NOTES : 1. If the operation stops to function of the protection device, the check display flashes.
2. Symbols used in wiring diagram above are. ◎ :Terminal block, :Connector, :PC board insertion tab.

CAUTION FOR SERVICING

- The connector marked S — is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

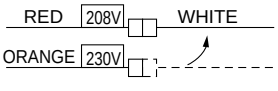
White connector



CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- ※ Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection as shown in the right figure.

※When Power Supply is 208V

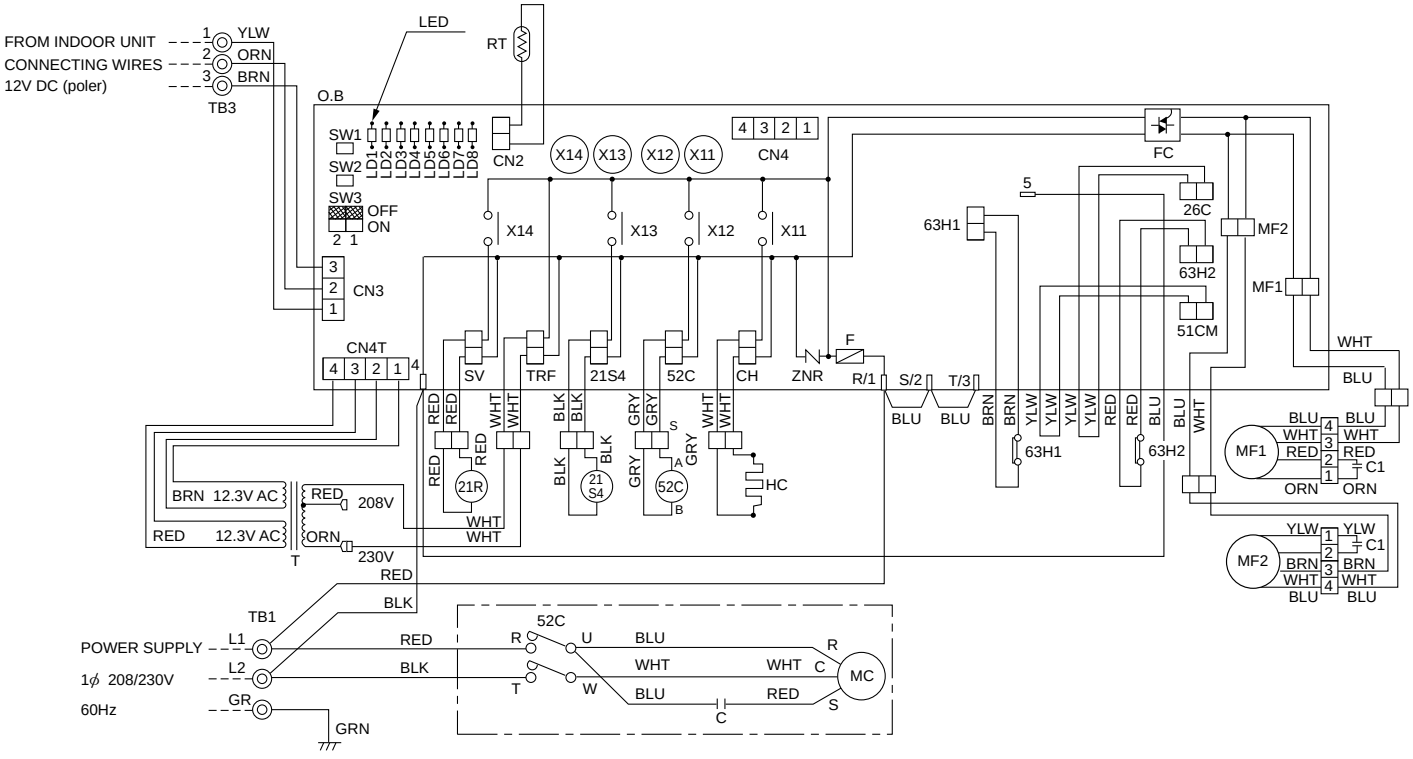



CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1,2,3) for indoor and outdoor units.

## MODELS PUH24/30/36EK WIRING DIAGRAM

| | | | | | |
|---|---|---|---|---|---|
| C | COMPRESSOR CAPACITOR | O.B | OUTDOOR CONTROLLER BOARD | X13<O.B> | R.V RELAY |
| C1,2 | FAN CAPACITOR | R | RESISTOR | X14<O.B> | BYPASS VALVE RELAY |
| C5 | COMPRESSOR START CAPACITOR | RT | OUTDOOR COIL THERMISTOR | ZNR<O.B> | VARISTOR |
| F<O.B> | FUSE<6A> | | <32˚F/15kΩ, 77˚F/5.4kΩ> | 19 | COMPRESSOR START RELAY |
| FC<O.B> | FAN CONTROLLER | SW1•2•3<O.B> | SELECTOR<CHECK,SERVICE> | 21R | BYPASS VALVE COIL |
| HC | CRANKCASE HEATER | T | TRANSFORMER | 21S4 | R.V COIL |
| LD1~LD8 | LED<CHECK,SERVICE> | TB1,3 | TERMINAL BLOCK | 52C | CONTACTOR |
| MC | COMPRESSOR<INNER THERMOSTAT> | X11<O.B> | CRANKCASE HEATER RELAY | 63H1 | CONTROL HIGH PRESSURE SWITCH |
| MF1,2 | FAN MOTOR<INNER THERMOSTAT> | X12<O.B> | COMPRESSOR RELAY | 63H2 | PROTECT HIGH PRESSURE SWITCH |

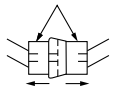



NOTES : Symbols used in wiring diagram above are. ◎ :Terminal block, :Connector, :PC board insertion tab.

CAUTION FOR SERVICING

● The connector marked S — is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

White connector

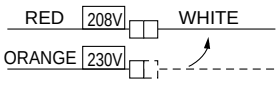


CAUTION FOR POWER SUPPLY WIRING

● Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.

※ Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection as shown in the right figure.

※When Power Supply is 208V

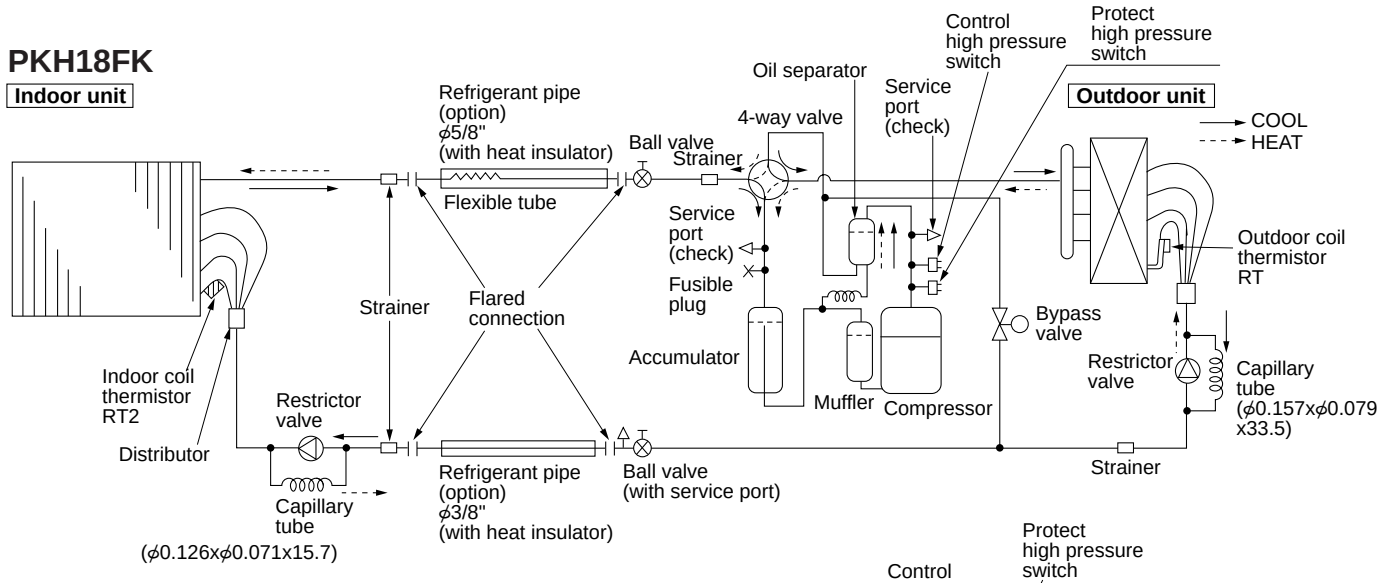



CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

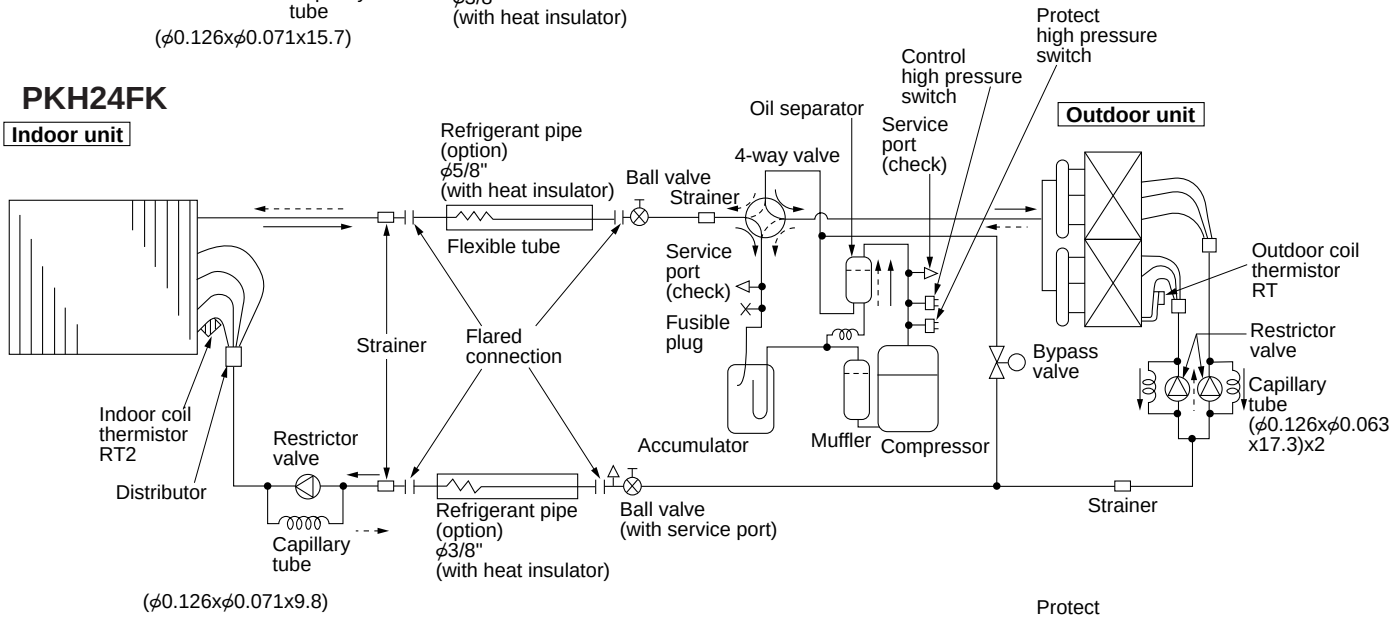
● Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1,2,3) for indoor and outdoor units.

# 6 REFRIGERANT SYSTEM DIAGRAM

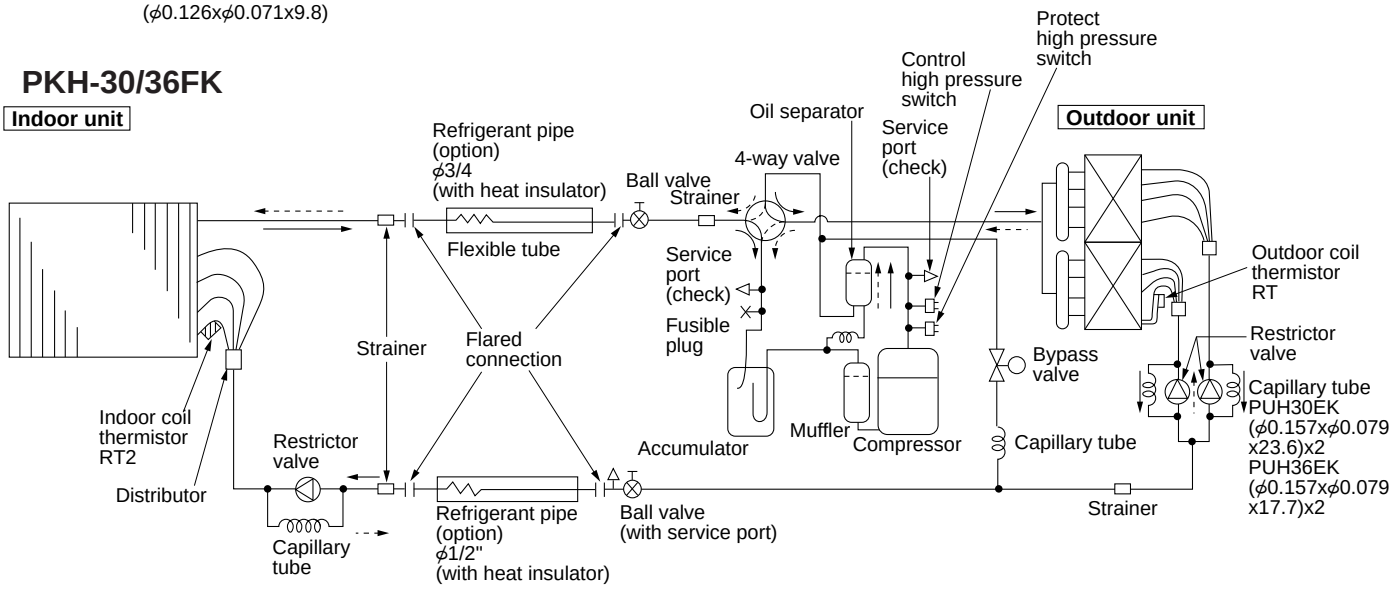
## PKH18FK




## PKH24FK




## PKH-30/36FK

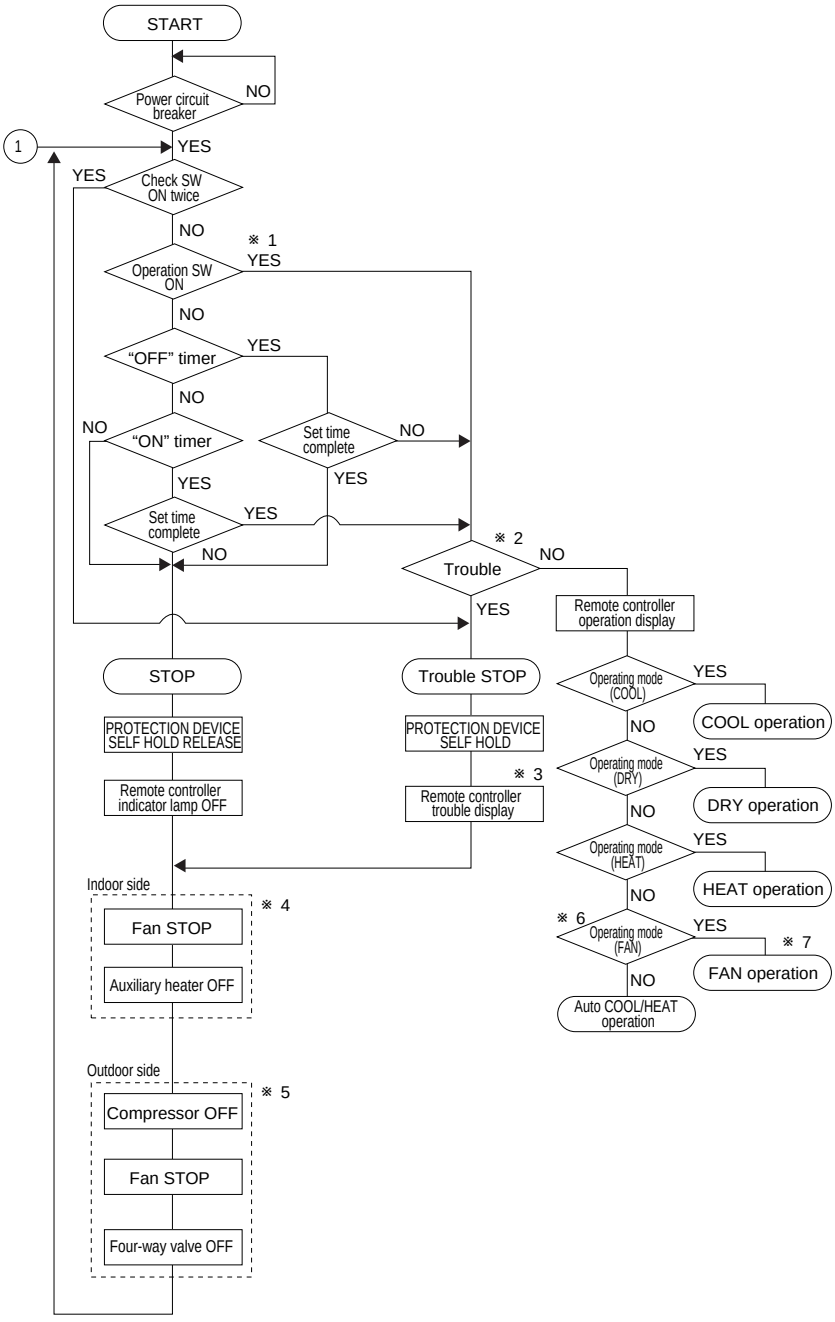



PKH30FK(ϕ0.157xϕ0.079x11.4)
PKH36FK(ϕ0.157xϕ0.079x11.4)

※ Capillary tubesize:(ODxIDxLength)
The symbol ϕ indicates diameter.

# 7 OPERATION FLOW-CHART

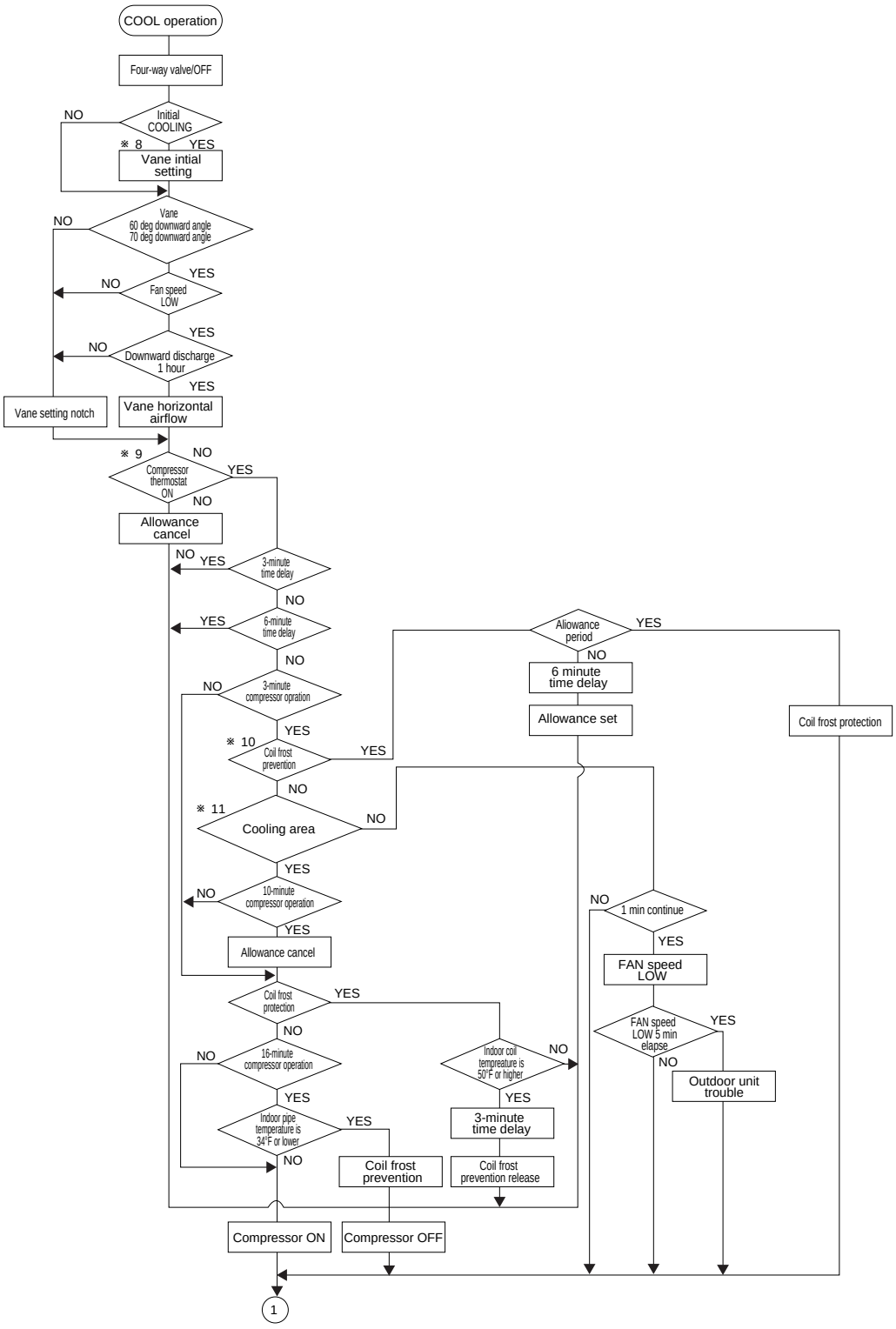
MAIN OPERATION




※1 In addition, the centralized and remote control can be operated.
※2 The modes which indicate the sources of trouble are listed below.
- EO=Signal transmitting/receiving error
- P1=Room temperature thermistor malfunction
- P2=Indoor coil thermistor malfanction
- P4=Drain sensor malfunction
- P5=Drain over flow
- P6=Coil frost/overheat protection
- P7=System error
- P8=Outdoor unit trouble

※3 The CHECK swich will show if an error has occurred in the past.
※4 Fan runs on low speed for 1 minute in order to remove overheat air.
※5 The 3-minute (6 minutes ··· heating mode) time-delay functions after compressor stops.
※6 FAN or AUTO mode is selected by the indoor dipswitch setting.
※7 In FAN mode, fan speed and vane operation depend on the remote controller setting. (Compressor is OFF.)

## COOLING OPERATION



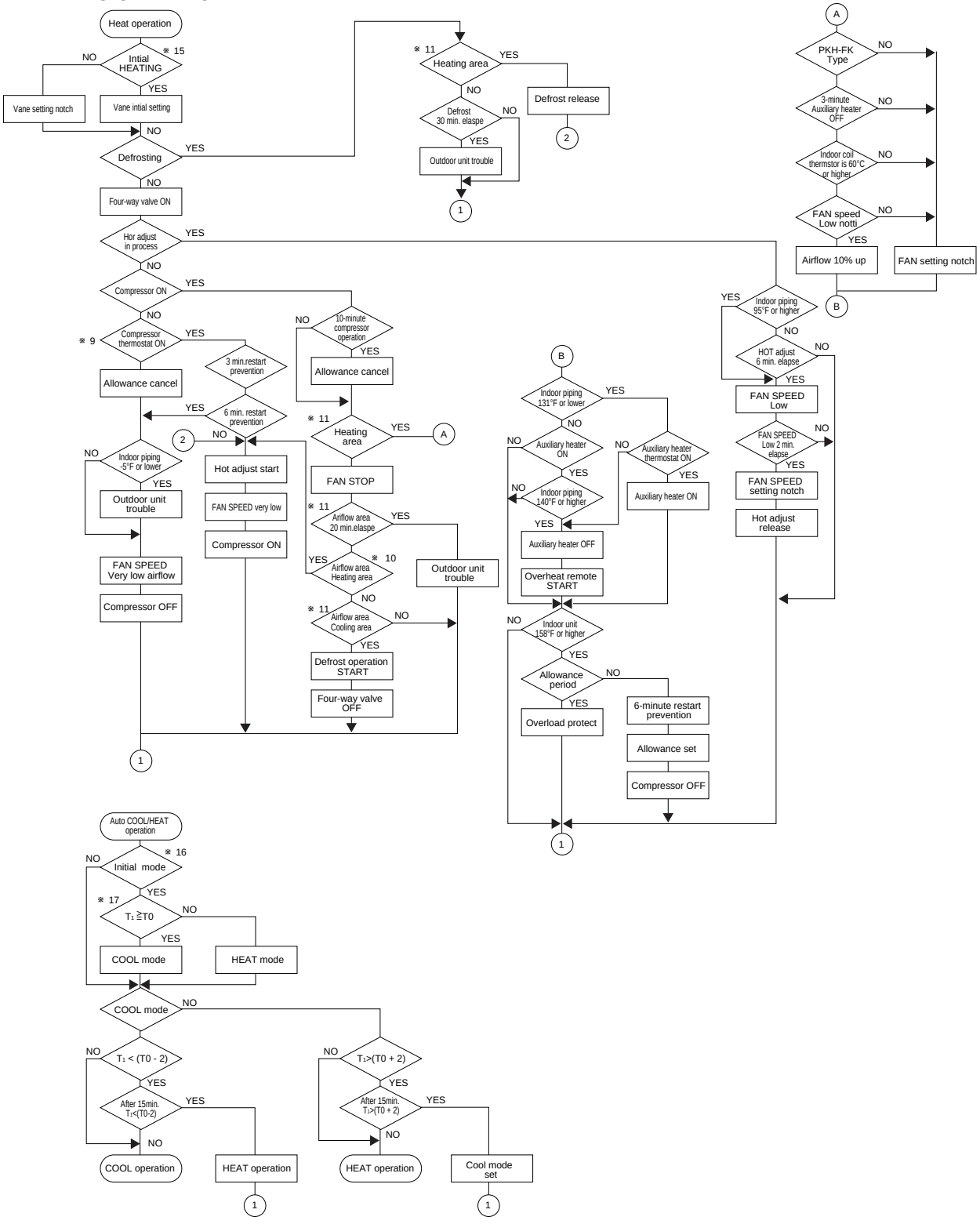

※8 When operation stops or changes to cooling or dry mode, the auto vane turns to a horizontal angle. IF operation changes during auto vane SWING, the auto vane will continue to swing.

※9 When operating TEST RUN, the thermostat will be continuously ON.

※10After 3 minute compressor operation, if the indoor coil thermistor reads -59°F or below for 3 minutes, the compressor will stop for 6 minutes.

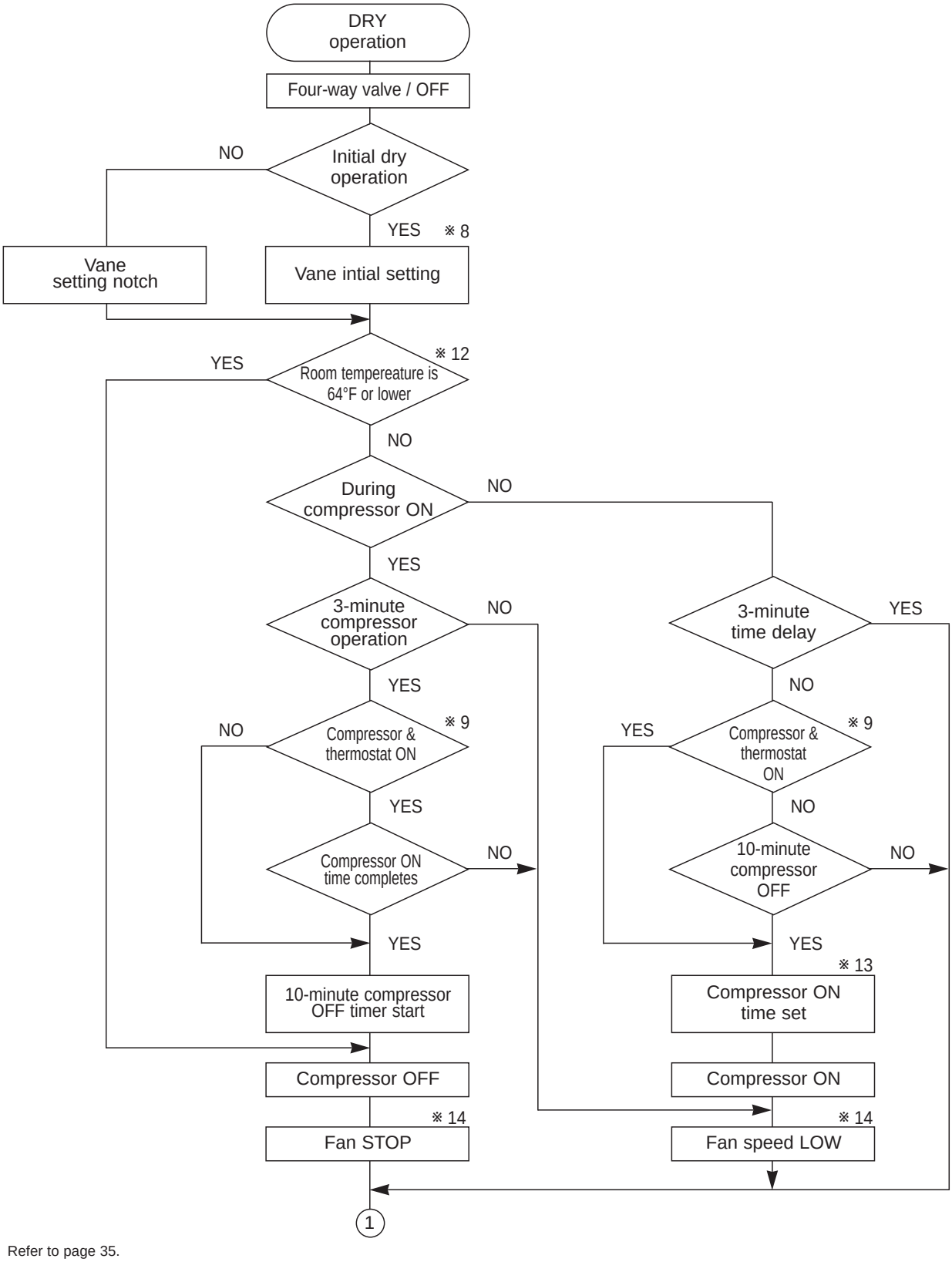
※11Cooling area : Indoor coil temperature is more than 9 degrees above the room temperature.
Heating area : Indoor coil temperature is more than 9 degrees below the room temperature.
FAN area : Indoor coil temperature is within 9 degrees either way of the room temperature.

HEATING OPERATION




※15 ( i ) Until Low airflow is set while hot adjustment
( ii ) While defrosting (FAN STOP)
( iii ) When thermostat is OFF
In the case of( i ), ( ii ) and ( iii ) above, airflow is horizontal regardless the VANE setting.
※16 When AUTO operation is started, COOL or HEAT mode is selected automatically.
※17 T1 : Room temperature.
To : Set temperature

## DRY OPERATION




※8 ~ 9 Refer to page 35.

※12 When room temperature is 4°F or below, the compressor cannot operate.
When room temperature rises over 64°F, the compressor starts after a 3-minute time delay.

※13 Compressor ON time is decided by room temperature. Refer to page 35.

※14 In dry operation, compressor ON makes the fan speed LOW and compressor OFF stops the fan.
It is not possible to set the fan speed with the remote controller

# 8 MICROPROCESSOR CONTROL

## 1.OUTLINE OF MICROPROCESSOR CONTROL

**INPUT to remote controller**

- OFF-ON switching.
- COOL/DRY-AUTO-HEAT selector switching.
- Thermostat setting.
- TIMER mode selector-switching and Timer setting.
- HIGH-LOW fan speed switching.
- AUTO Vane selector (AIR DISCHARGE) switching.
- TEST RUN switching.
- CHECK mode switching. (Self diagnostic trouble shooting)

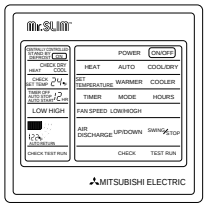
**Remote controller board**

- Processes and transmits orders.orders.

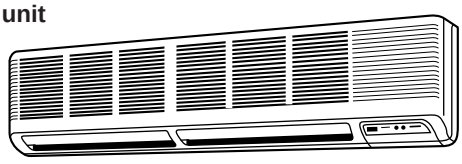
**OUTPUT to remote controller**

**Remote controller**

- LCD indicator




**Indoor unit**



12VDC

Non-polar, two-wire cable maxinmum length 500 meters

Signal

**INPUT from indoor unit**

- Room temperature thermistor (RT1)
- Indoor coil thermistor (RT2)

**Indoor controller board**

- Receives orders from remote controller and temperature data from indoor unit.
- Processes orders and data.
- Controls indoor and outdoor operation.
- Self diagnostic function.
- ※ System control operation.
- ※ Emergency operation.
- ※ Set by dipswitch on indoor controller board.
- Transmits the power to remote controller.

**OUTPUT to indoor unit**

- Autovane's angle setting.
- Booster heater ON-OFF Control.
- Emergency stop.

1 2 3

Polar three-wire cable

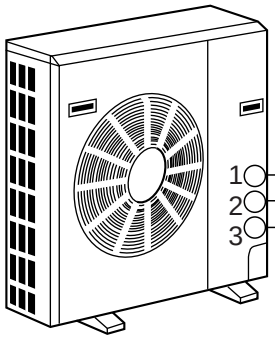
**OUTPUT to outdoor unit**

- Compressor and outdoor fan : ON-OFF
- Operation mode change :COOL-HEAT.

**Independent Control of Outdoor Unit**

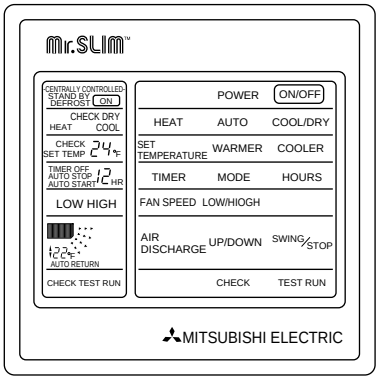
- Compressor protection-device working
- Defrosting START-STOP
- Fan speed control.
- Crankcase heater control ON-OFF.
- Self diagnostic function

**Outdoor unit**



## 2. INDOOR UNIT CONTROL

### 2-1 COOL operation




**<How to operate>**

① Press POWER ON/OFF button.

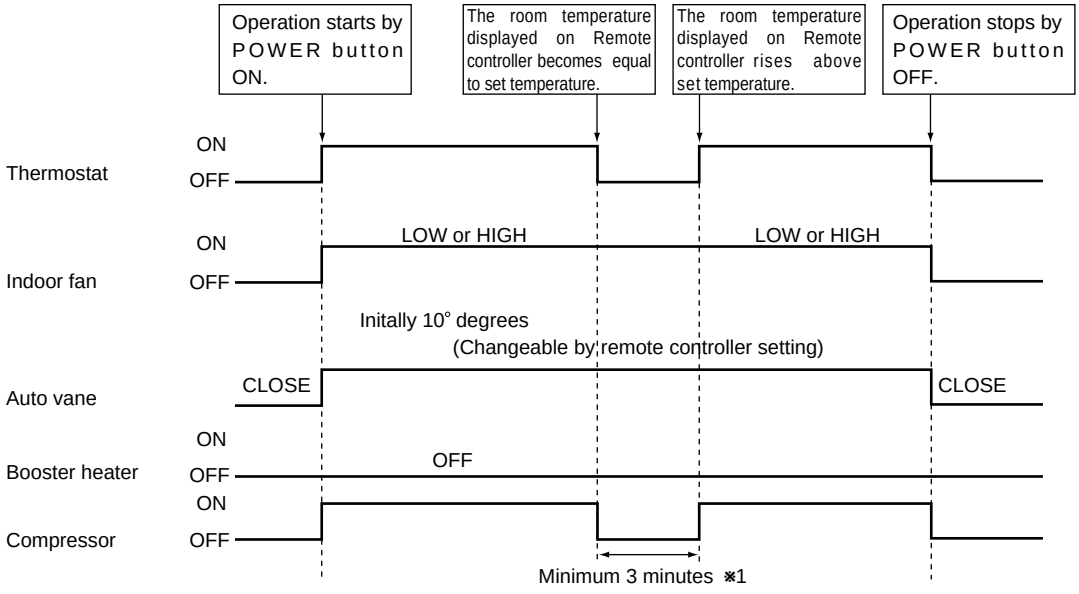
② Press COOL / DRY button to set operation mode to Cool.

**NOTE** : "Cool" and "DRY" are alternately displayed each time COOL / DRY button is pressed.

③ To set desired temperature, press WARMER or COOLER button.

**NOTE** : Set temperature changes by 2˚F in the range 66~86˚F, each time WARMER or COOLER button is pressed.

**<COOL operation time chart>**




※1 Even if the room temperature displayed on remote controller rises above the set temperature during this period, the compressor will not start until this period has ended.

**(1) Compressor control**

① 3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

② The compressor runs when the room temperature displayed on remote controller is higher than set temperature.

The compressor stops when the room temperature displayed on remote controller is equal to or lower than the set temperature.

③ The compressor stops in check mode or during protective functions.

④ Coil frost preventionTo prevent indoor coil frost, the compressor will stop when the indoor coil thermistor (RT2) reads 34°F or below after the compressor has been continuously operated for at least 16 minutes or more. When the indoor coil temperature rises to 50°F or above, the compressor will start after a 3-minute time delay.

**NOTE** : The start temperature of coil frost prevention changes 34°F to - 27°F.

⑤ Coil frost protection

When indoor coil temperature becomes 5°F or below, coil frost protection will proceed as follows.

**<Start condition>**

After the compressor has been continuously operated for 3 minutes or more,and the indoor coil temperature has been 5°F or below for 3 minutes,the coil frost protection will start.

**<Coil frost protection>**

Compressor stops for 6 minutes, and then restarts.

If the start condition is satisfied again during the first 10 minutes of compressor operation, both the indoor and outdoor units stop, displaying a check code of “P8” on the remote controller.

**<Termination conditions>**

Coil frost protection is released when the start condition is not satisfied again during the allowance, or when the COOL mode stops or changes to another mode.

**(2) Indoor fan control**

Indoor fan speed LOW/HIGH depends on the remote controller setting.

However, if an outdoor unit abnormality is detected, the indoor fan speed will be LOW, regardless of the remote controller setting.

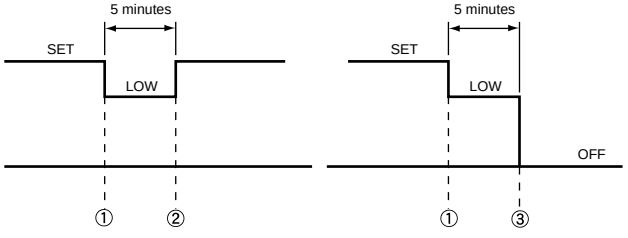
When the outdoor unit abnormality detection is released and the fan speed returns to the set speed, the quiet cycle control will work.

(a) Normal control

(i) Fan speed LOW/HIGH depends on the remote controller setting regardless of the thermostat ON/OFF.

(ii) Fan speed will remain on LOW if an abnormality in outdoor unit is detected. (5 minutes)

When the abnormality detection is released, the fan speed returns to the set speed.




① Start-up of outdoor unit abnormality detection.

② Release of outdoor unit abnormality detection.

③ Unit stop due to outdoor unit abnormality with P8 indication.

**NOTE 1** : Fan stops immediately if the unit stops or the check mode is started.

**(3) Auto vane control**

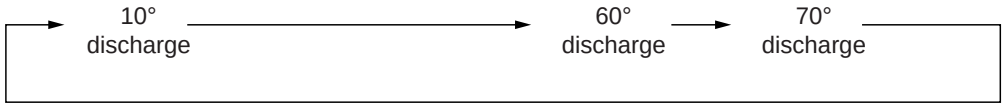
Auto vane position is set to 10degrees discharge at the start-up of COOL operation. It can then be changed by the remote controller.

(a) Stop mode (fixed operation)

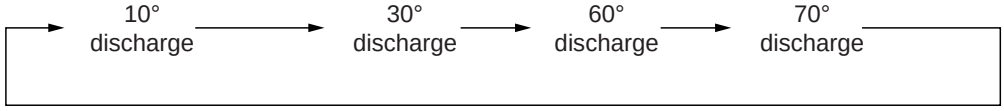
( i ) At start-up of COOL operation, the auto vane is set to 10 degrees discharge direction.

( ii ) Discharge direction can be changed with AIR DISCHARGE UP/DOWN botton.

① Fan speed : LOW




② Fan speed : HIGH



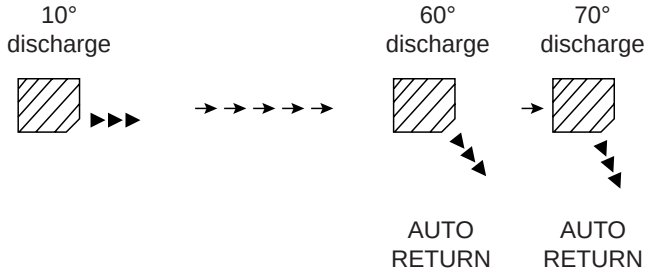

(b) SWING mode

( i ) The vane motor turns ON when the SWING mode is selected.
The vane motor is continuously ON during SWING mode.

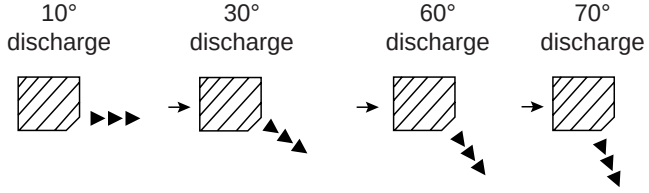
( ii ) When SWING mode is changed to STOP mode, the discharge direction returns to the position of the last STOP mode.

<AUTO RETURN>

① Fan speed : LOW




② Fan speed : HIGH



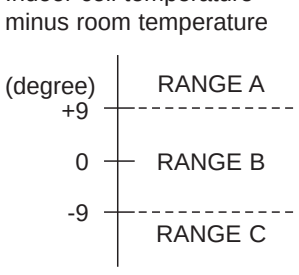

When 60 degrees or 70 degrees discharge is selected with the LOW fan speed in COOL operation, “Auto RETURN” will appear below the temperature display. One hour later, the discharge direction returns to 10 degrees automatically and “AUTO RETURN” will disappear. If the discharge direction is set to 10 degrees during “AUTO RETURN” indication, the time counting for AUTO RETURN is cancelled.

<Auto vane drive>
(a) The vane is driven by DC12V motor.
(b) Air discharge direction is selected depends on the number of pulse were sended.
(c) Before start driving the auto vane, detect the standard position first, output the number of pulse to each air discharge.
(d) The speed of the auto vane drive for both open and close are setted at 200 pulse/sec.
(e) Method of driving the auto vane.
① Detecting the standard position:
Output 1600 pulse to the opening direction.
② Position setting:Output the number of pulse indicated no below chart to the closing direction.

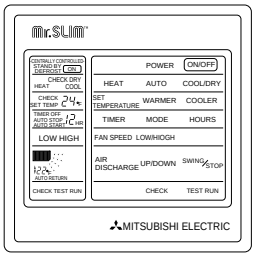
| | The number of pulse outputed after detecting the standard position |
|---|---|
| Close | 1600 |
| Horizontal | 680 |
| Downward A | 578 |
| Downward B | 283 |
| Downward C | 113 |

**(4) Detecting abnormalities in the outdoor unit**

After the compressor has been continuously operated for 3 minutes, if the difference between the indoor coil temperature and room temperature is out of RANGE C for 1 minute, the indoor fan speed will turn to LOW. Five minutes later, if the difference is still out of
RANGE C,the outdoor unit is functioning abnormally. Thus, the compressor stops and check code “P8” appears on remote controler.
RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.
RANGE B : Indoor coil temperature is within 5 degrees either way of room temperature.
RANGE C : Indoor coil temperature is more than 9 degrees below room tempetature.



## 2-2 DRY operation




**<How to operate>**

① Press POWER ON/OFF button.

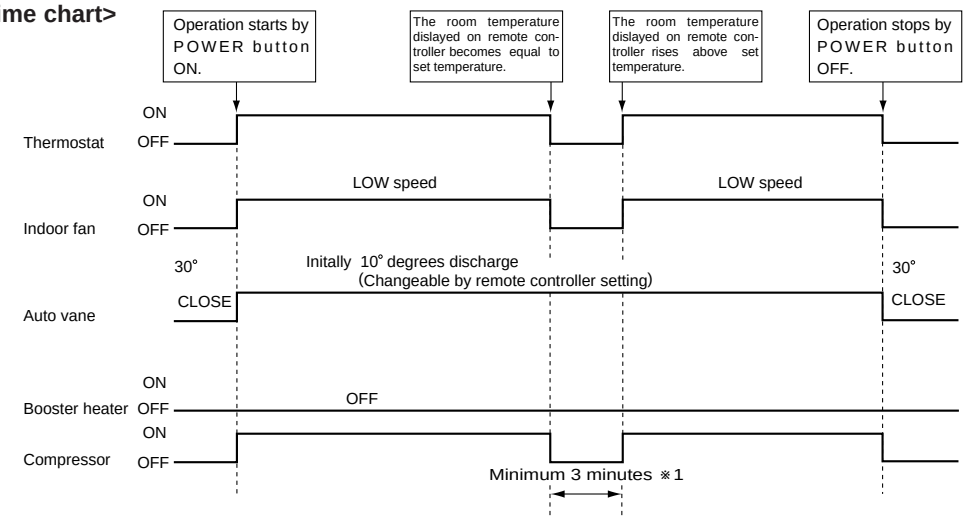
② Press COOL / DRY button to set operation mode to DRY.

**NOTE** : "Cool" and "DRY" are alternately displayed each time COOL / DRY button is pressed.

③ To set desired temperature, press WARMER or COOLER button.

**NOTE** : Set temperature changes by 2˚F in the range 66~86˚F, each time WARMER or COOLER button is pressed.

**<DRY operation time chart>**




※1 Even if the room temperature dispayed on remote controller above the set temperature during this period, the compressor will not start until this period has ended.

**(1) Compressor control**

①3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stop.

②The compressor runs when the room temperature displayed on remote controller is higher than the set temperature.
The compressor stops when the room temperature displayed on remote controller is equal to or lower than the set temperature.

③The compressor stops in check mode or during protective functions.

④The compressor will not start when the room temperature displayed on remote controller is below 64°F.
The compressor starts intermittent operation when the power is turned ON with room temperature above 64°F. The compressor ON/OFF time depends on the thermostat ON/OFF and the following room temperatures.After 3-minute compressor operation,

- If the room temperature thermistor reads above 82°F with thermostat ON, the compressor will operate for 6 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 79°F—82°F with thermostat ON, the compressor will operate for 4 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 75°F—79°F with thermostat ON, the compressor will operate for 2 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads below 75°F with thermostat ON, the compressor will stop for 3 minutes.
- If the thermostat is OFF regardless of room temperature, the compressor will stop for 10 minutes.

⑤Coil frost protection in DRY operation is the same as in COOL operation.

⑥Coil frost prevention does not operate in DRY operation.

**(2) Indoor fan control**

The indoor fan runs on LOW speed during compressor operation. The fan speed cannot be changed with the remote controller. Also, the indoor fan does not run during compressor OFF.

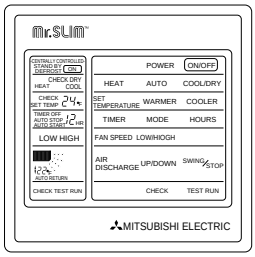
**(3) Auto vane & drain pump controls**

Same as in COOL operation

**(4) Detecting abnormalities in the outdoor unit**

An abnormality in the outdoor unit can not be detected in DRY operation.

## 2-3 HEAT operation




**<How to operate>**

① Press POWER ON/OFF button.

② Press HEAT button to set operation mode to HEAT.

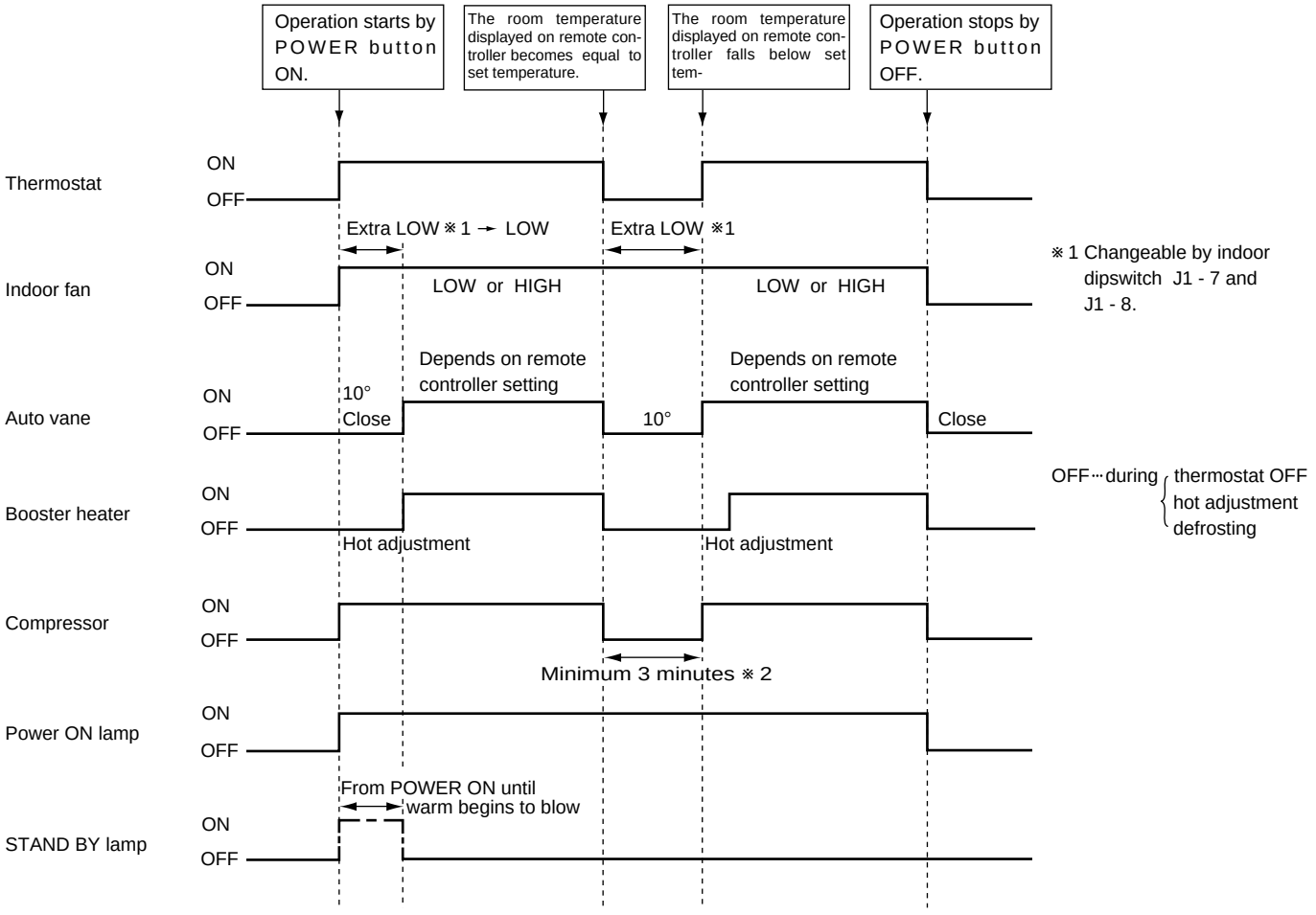
③ To set desired temperature, press WARMER or COOLER button.

**<Display in HEAT operate>**

"STAND BY" is displayed from HEAT operation start until warm air begins to blow.

"DEFROST" is displayed during defrosting.

**<HEAT operation time chart>**


Operation starts by POWER button ON.
The room temperature displayed on remote controller becomes equal to set temperature.
The room temperature displayed on remote controller falls below set tem-
Operation stops by POWER button OFF.
Thermostat
ON
OFF
Extra LOW ※1 → LOW
Extra LOW ※1
Indoor fan
LOW or HIGH
LOW or HIGH
※1 Changeable by indoor dipswitch J1 - 7 and J1 - 8.
Depends on remote controller setting
Depends on remote controller setting
Auto vane
10° Close
10°
Close
OFF…during thermostat OFF hot adjustment defrosting
Booster heater
Hot adjustment
Hot adjustment
Compressor
Minimum 3 minutes ※2
Power ON lamp
From POWER ON until warm begins to blow
STAND BY lamp

※2 Even if the room temperature displayed on remote controller rise above the set temperature during this period, the compressor will not start until this period has ended.

**(1) Compressor control**

①3-minute time delay
To prevent overload, the compressor will not start within 6, minutes after stop.

②The compressor runs when the the room temperature displayed on remote controller is lower than the set temperature.
The compressor stops when the the room temperature displayed on remote controller is equal to or higher than the set temperature.

③The compressor stops in check mode or during protective functions.

④Overheat protection

**<Start condition>**

When the indoor coil thermistor reads 158°F or above, the overheat protection will start.

**<Overheat protection>**

The compressor stops for 6 minutes, and then restarts.

If the start condition is satisfied again within 10 minutes of compressor operation, both the indoor and outdoor units stop, displaying a check code of “P6” on the remote controller.

**<Termination conditions>**

Overheat protection is terminated when the start condition is not satisfied again during the allowance (10-minute compressor operation), when operation mode changes to other mode, or when thermostat turns OFF.

**(2) Indoor fan control**

(a) Nomal control

( i )The indoor fan runs on EXTRA-LOW speed during the thermostat OFF.
EXTRA-LOW speed can be changed to LOW or HIGH speed by setting the (J1-7, J1-8) If the indoor coil temperature becomes more than 9 degrees below the room temperature during the thermostat OFF, the indoor fan will stop. After, when the indoor coil temperature becomes within 9 degrees of room temperature, the indoor fan will run on EXTRA-LOW speed.

( ii )Hot adjustment Hot adjustment is a warm-up for HEAT operation
<Start conditions>
The hot adjustment works under any of the follwing conditions.
- HEAT operation starts.
- Defrosting ends.
- Thermostat turns ON.[Hot adjustment]

Initially, the indoor fan runs on EXTRA-LOW speed. When 5 minutes have passed or the indoor coil temperature exceeds 95°F, the fan speed changes to LOW. Two minutes later, the hot adjustment ends. Then, the fan speed depends on the remote controller setting.

( iii )The indoor fan stops when the indoor coil temperature is within 9 degrees either way of room temperature.

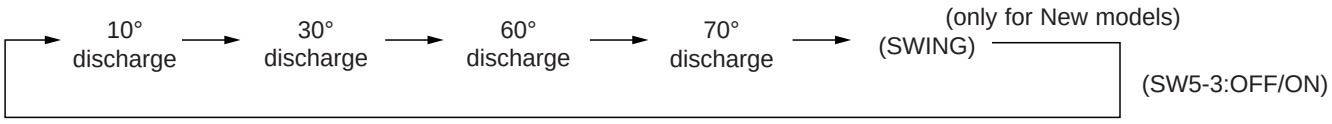
( iv )To eliminate the remaining heat, the indoor fan runs for the first 1 minute after the booster heater is turned OFF.

**(3) Auto vane control**

(a) STOP mode (fixed operation)

( i ) The discharge direction at the start-up of HEAT operation is the same as that of the previous operation.

( ii ) The discharge direction can be charged by the remote controller setting.




In the following cases, discharge direction becomes 10° regardless of the remote controller setting.

① During the hot adjustment with fan speed at EXTRA-LOW

② During defrosting with indoor fan OFF

③ During the thermostat OFF

(b) SWING mode

( i ) The vane motor turns ON when the SWING mode is selected.
The vane motor is continuously ON during SWING mode.

( ii ) In the following cases, the discharge direction is 10° regardless of the remote controller setting.

① During the hot adjustment with fan speed at EXTRA-LOW

② During defrosting with indoor fan OFF

③ During thermostat OFF

**(4) Booster heater control**

When the room temperature is 5 degrees below the set temperature, the booster heater will turn ON.
When the room temperature is equal to the set temperature, booster heater will turn OFF.
During the hot adjustment, the booster heater will not work.

**<Overheat prevention>**

When the indoor coil thermistor rises to 140°F or above, the booster heater cannot work.
When the indoor coil thermistor falls to 131°F or below, the booster heater can work.

**(5) Detecting abnormalities in the outdoor unit**

When the outdoor unit is determined to be abnormal by the following causes, the compressor will stop and the check code " P8 " will appear on the remote controller display.

① During compressor ON after hot adjustment ※1 (See the next page.)

① If the difference between the indoor coil temperature and room temperature is in the RANGE B, the indoor fan will stop.

② Within 20 minutes after entering RANGE B (except for the first 10 seconds),

a) If the temperature difference enters RANGE A, the hot adjustment stasrts,

b) If the temperature difference is still in RANGE B, the outdoor unit is deemed abnormal.

c) If the temperature difference enters RANGE C, defrosting starts.
Within 30 minutes after entering RANGE C,

- If the temperature difference does not return to RANGE B,the outdoor unit is deemed abnormal.
- If the temperature difference returns to RANGE B, the next 20 minutes is an allowance period. If the difference enter RANGE A during the allowance, defrosting ends and the hot adjustment starts. If the difference does not enter RANGE A during the allowance, the outdoor unit is deemed abnormal.

② During compressor ON in hot adjustment

After 30 minutes of defrosting in hot adjustment, if the temperature difference is still in RANGE C, the outdoor unit is determined to be abnormal.

③ During compressor OFF

After 20 minutes of thermostat OFF, if the indoor coil thermistor reads -13°F or below, the outdoor unit is determined to be abnormal.

**(6) Indoor coil thermistor abnormality detection**

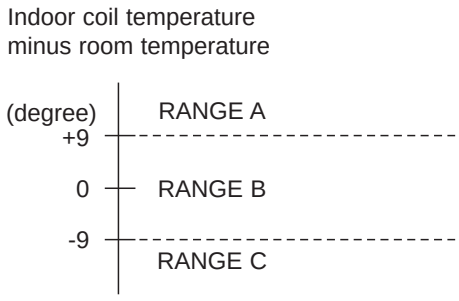
An abnormality can be detected during compressor ON, except for the following.

- ●For the first 30 minutes after the temperature difference between the indoor coil temperature and room temperature enters the RANGE C.
- ●When the temperature difference enters the RANGE C until it moves to the RANGE B.

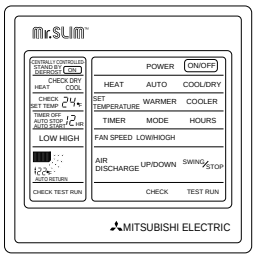
**(7) Defrosting operation**

After the outdoor unit starts the defrosting operation, when the temperature difference between the indoor coil temperature and room temperature gets out of RANGE A and into RANGE B, the indoor unit starts the defrosting mode. After the outdoor unit stops the defrosting operation, when the temperature difference returns to the RANGE A, the indoor unit stops the defrosting mode. While the indoor unit is in the defrosting mode, the indoor fan and the booster heater stop.

※1 RANGE A : Indoor coil temperature is more than 9 degrees above room temperataure.
RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.
RANGE C : Indoor coil temperature is more than 9 below room temperature



## 2-4 AUTO operation (Automatic COOL/HEAT change over operation)




**<How to operate>**

① Press POWER ON/OFF button.

② Press AUTO button to set operation mode to AUTO.

③ To set desired temperature, press WARMER or COOLER button.

**NOTE** : Set temperature changes by 2˚F in the range 66~86˚F, each time WARMER or COOLER button is pressed. Once the desired temperature is set, operation mode is switched automatically between COOL and HEAT according to room temperature.

**(1) Initial mode**

① When AUTO operation starts after unit OFF.

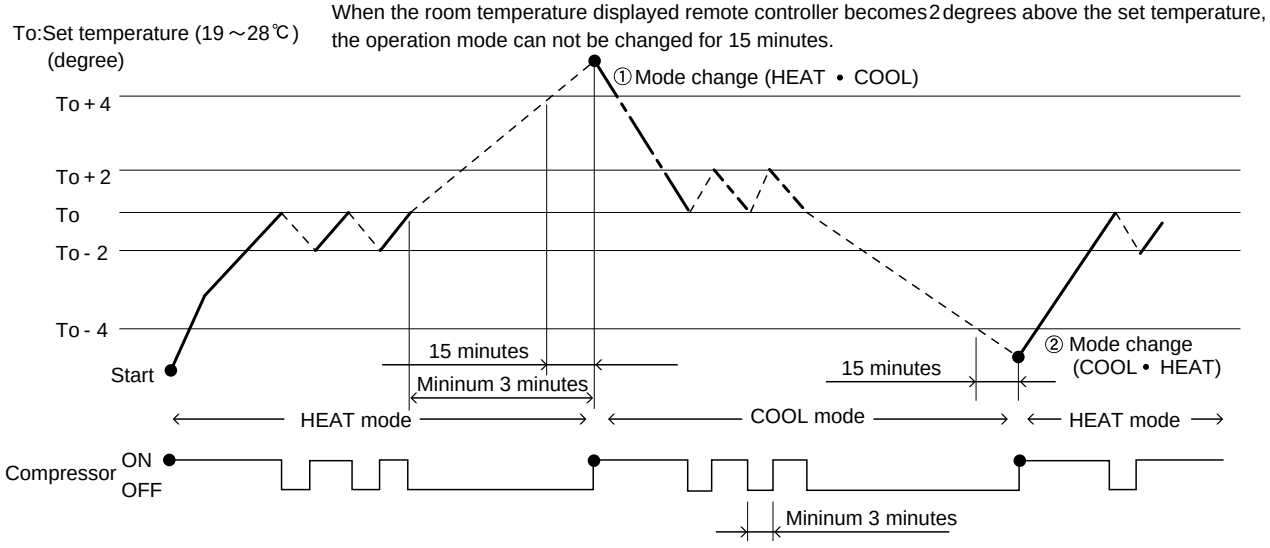
- If the room temperature displayed on remote controller is higher than the set temperature, operation starts in COOL mode.
- If the room temperature displayed on remote controller is equal to or lower than the set temperature, operation starts HEAT mode.

② When AUTO operation starts after COOL or HEAT operation, the previous mode continues.

**(2)Mode change**

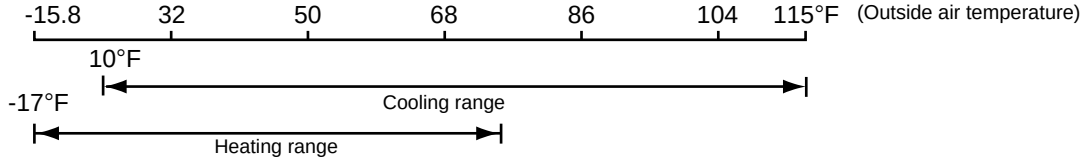
① HEAT mode changes to cool mode when 15 minutes have passed since the room temperature became 2 degrees above the set temperature.

② COOL mode changes to HEAT mode when 15 minutes have passed since the room temperature became 2 degrees below the set temperature.

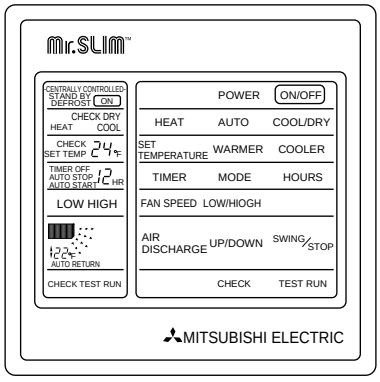



**(3)Temperature range**

AUTO operation is available under the outside air temperatures as follows.



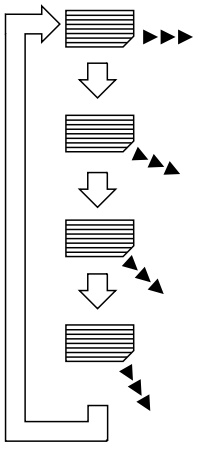
## 2-5 Auto vane control




**<How to operate>**
To change the air flow direction, press AIR DISCHARGE UP/DOWN button.

| ① | ② | ③ | ④ |
|---|---|---|---|
| 10° | 30° | 60° | 70° |

<Remote controller display>



① discharge

② downward discharge ..... Available in COOL operation with fan speed on HIGH or in HEAT operation.
Unavailable in DRY operation.
If fan speed changes from LOW to HIGH during 30° downward discharge in COOL mode, the direction automatically changes to 10°.

③ downward discharge

④ downward discharge

Changes by pressing the AIR DISCHARGE UP/DOWN button.

**(1) COOL/DRY operation**

At the start-up of COOL or DRY operation, the discharge direction in automatically set to 10°. After, it can be changed to another direction with AIR DISCHARGE UP/DOWN button on the remote controller.

**<Auto return>**

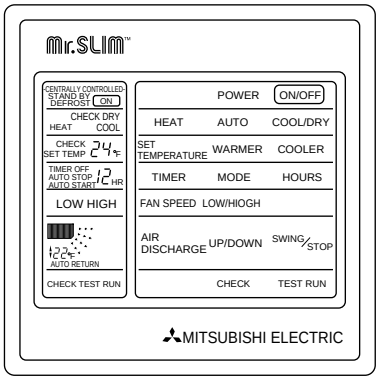
When 60° or 70° discharge is set with fan speed on LOW, “AUTO RETURN” appears below the room temperature display. One hour later the direction changes to 10° degrees, automatically and “AUTO RETURN” disappears.

**(2) HEAT operation**

At the start-up of HEAT operation, discharge direction depends on the setting of the last operation.
After, it can be changed to another direction with AIR DISCHARGE UP/DOWN button. The discharge direction shifts to 10° regardless of the remote controller settings under any of the following conditions.

- Thermostat OFF
- Defrosting
- Indoor fan speed EXTRA-LOW in hot adjustment

## 2-6 TIMER operation




**<Timer function>**

AUTO STOP ·····The air conditioner stops after the set time lapses.

AUTO START ·····The air conditioner starts after the set time lapses.

AUTO OFF ·····Timer is not active.

**<How to operate>**

1. Press POWER ON/OFF button.
2. Press TIMER HOURS button to select AUTO STOP or AUTO START.
3. Press TIMER HOURS button to set desired time.
   Time setting is in 1 hour units for up to 24 hours.
   Each time HOURS button is pressed, set time increases by 1 hour.
   When HOURS button is pressed and held, the set time increases by 1 hour every 0.5 seconds.
4. To cancel the timer operation, press POWER ON / OFF button.

**<Timer setting example>**

AUTO STOP 8 HR

This setting will stop the air conditioner in 8 hours.
With the lapes of time, time display changes in 1 hour units, showing remaining time.

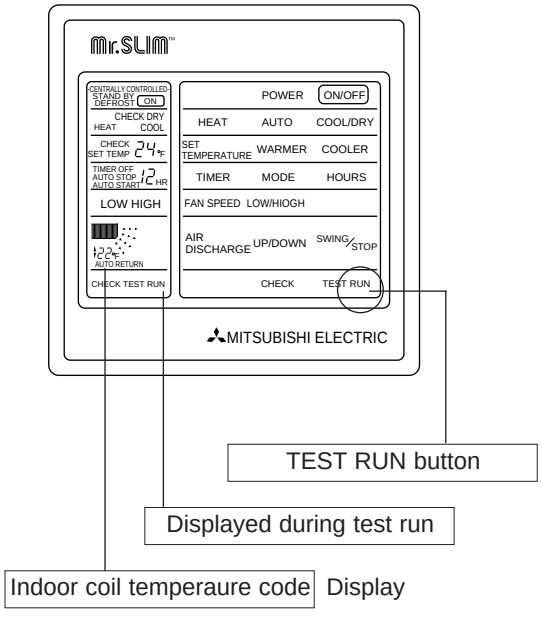
## 2-7 Test run

**<Before test run>**

- After installing, wiring, and piping the indoor and outdoor units, check for refrigerant leakage, looseness in power supply or control wiring, and mistaken polarity.
- Use a 500-volt megger to check the resistance between the power supply teminal block and ground to make sure that it is at least 1.0MΩ.

**Attention:**

**Do not use the air conditioner if resistance is less than 1.0MΩ.**




**<How to operate>**

1. Turn ON main breaker.
2. Press TEST RUN button twice. “TEST RUN” is displayed on remote controller.
3. Press COOL / DRY button to check that cool air is being discharged.
4. Press AIR DISCHARGE UP / DOWN button to check auto vane operation.
5. Check outdoor fan operation.
6. Check compressor operation referring to the indoor coil temperature code displayed on the remote controller. (See next page.)
7. The test run works for 2 hours and stops automatically. To cancel the test run, press POWER ON / OFF button or TIMER MODE button.
8. After checking, turn OFF the main breaker.

(1) Indoor coil temperature code

During the test run, the indoor coil temperature code from 1 to 15 is displayed on the remote controller instead of room temperature. The code should fall with the lapse of time in normal COOL operation, and should rise in normal HEAT operation.

| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Indoor coil temperature | ~40~34°F | ~50°F | ~59°F | ~68°F | ~77°F | ~86°F | ~95°F | 104°F |
| Code | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| Indoor coil temperature | ~113°F | ~122°F | ~131°F | ~140°F | ~158°F | | Thermistor abnormality | |

(2) Trouble during test run

- If the unit malfunctions during the test run, refer to section 10 in this manual entitled “TROUBLESHOOTING.”
- When the optional program timer is connected to the conditioner, refer to its operating instructions.

**2-8 Emergency operation**

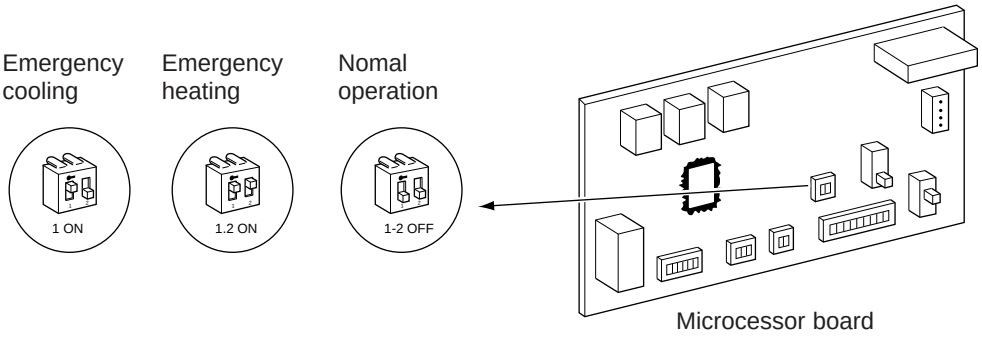
When the remote controller or microprocessor malfunctions but all other parts are normal, emergency operation is started by setting the dipswitch SW3 on the indoor controller board.

**<Before emergency operation>**

1. Make sure the compressor and the indoor fan are operating normally.
2. Locate the defect with the self-diagnostic function. When the self-diagnostic function indicates “protective function is working”, release the protective function before starting the emergency operation.
   CAUTION: When the self-diagnostic function indicates a check code of “P5” (drain pump malfunction), DO NOT start the emergency operation because the drain may overflow.

**<How to operate>**

1. For emergency cooling, set the dipswitch SW3-1 to ON and SW3-2 to OFF.
   For emergency heating, set the dipswitch SW3-1,2 to ON.




2. Turn ON the outdoor unit breaker and then turn ON the indoor unit breaker.
   Emergency operation will now start.
3. During emergency operation, the indoor fan operates on high speed, but the swing louvers and the auto vanes do not operate.
4. To stop emergency operation, turn OFF the indoor unit breaker.

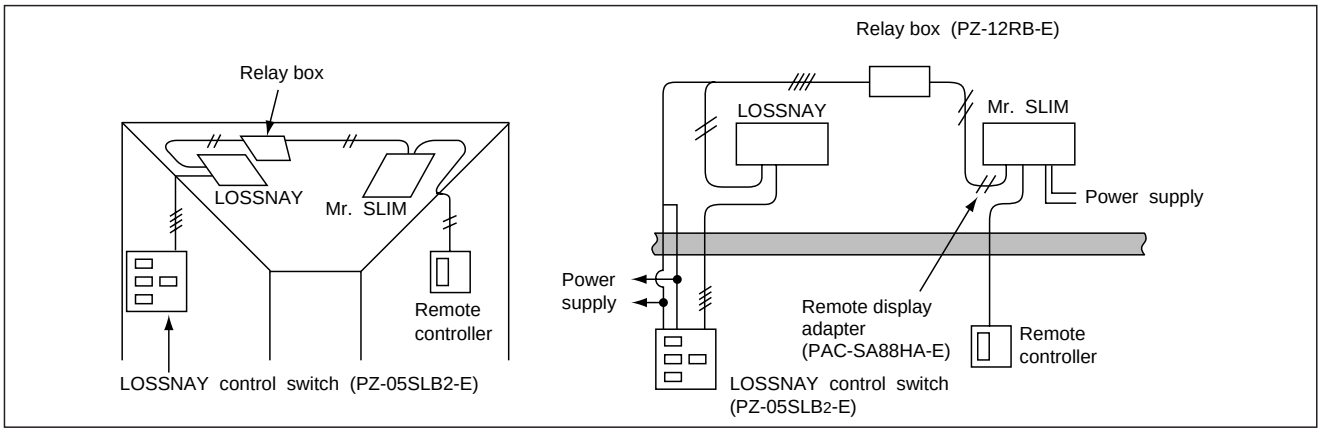
NOTE: The remote controller POWER ON/OFF button can not start/stop emergency operations.

CAUTION: Do not use emergency cooling for more than 10 hours, as the indoor coil may freeze.

## 2-9 Interlock with ventilation system (LOSSNAY)

Mr. SLIM/LOSSNAY interlock operation is available by using the optional parts listed below.

(1) System organization




(2) Required parts are:

- Relay box (PZ-12RB-E) ••• Contact capacity 10A
- Remote display adapter (PAC-SA88HA-E)···An optional part for Mr. SLIM
- LOSSNAY control switch (PZ-05SLB-2-E)···For LOSSNAY individual operation

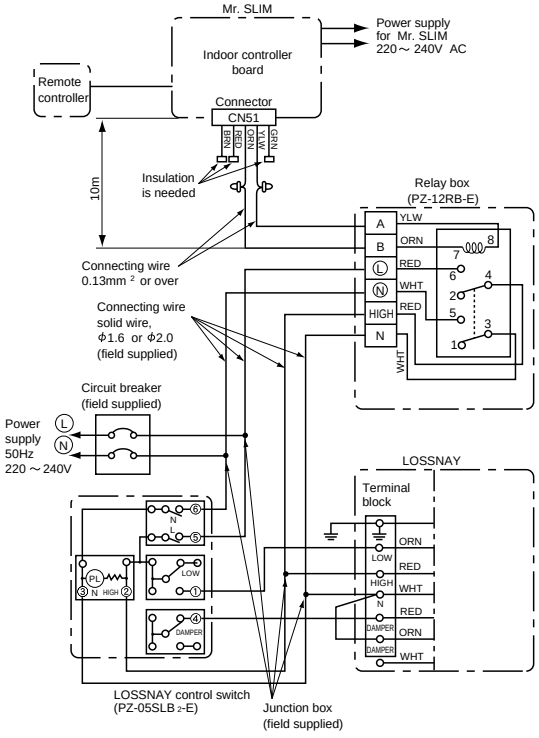
(3) Operation

①LOSSNAY turns ON/OFF according to Mr. SLIM ON/OFF

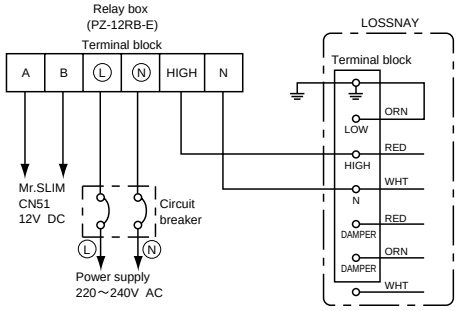
②While Mr. SLIM is OFF, LOSSNAY individual operation is available by using the LOSSNAY control switch. When Mr. SLIM turns OFF with the LOSSNAY control switch at ON, LOSSNAY will continue to operate.

(4) Wiring.

①When the LOSSNAY control switch is used:




②When the LOSSNAY control switch is not used:




NOTE: For further information, refer to the LOSSNAY technical & service manual.

**2-10 Dip switch and jumper connector functions**

Each figure shows the initial factory setting.

**1 On remote controller board**

(1) SW17(Address selector)

SW17-1 ~ 6) For address setting

SW17-7) When two remote controllers are used, this switch sets the controller function.
OFF: The remote controller is set as a main controller.
ON: The remote controller is set as a sub controller.

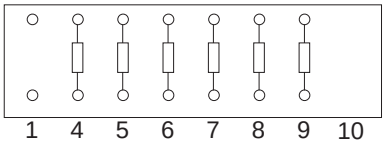
SW17-8) Switch for system back-up
OFF: Without back-up
ON: With back-up

SW17-9) Switch for temperature unit
OFF: °C ( Celsius)
ON: °F (Fahrenheit)

SW17-0) Switch for louvers
OFF: Unit with louvers
ON: Unit without louvers

**3. On indoor controller boaed**

(1) J1 (Mode selector)




J1-1) Switch that changes between FAN mode and AUTO mode.
Provided: Fan mode for models without heat pump.
Not provided: AUTO mode for models without heat pump.

J1-4) Switch for drain pump
Provided: The drain pump works in only COOL operation
Not provided: The drain pump works in both COOL and HEAT operation

J1-5) Switch to change the temperature to start coil frost prevention
Provided : 34°F (For all current models)
Not provided: -27°F (For previous special models)

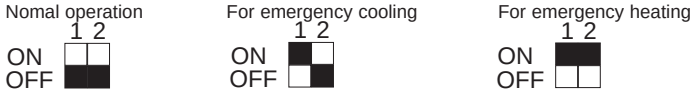
J1-6) Switch for set temperature adjustment in HEAT mode
During HEAT operation, warm air collects near the ceiling. When the indoor unit is installed near the ceiling, the temperature read by room temperature thermistor differs from the actual living-space temperature by about 7 degrees. Therfore, the room temperature read by room temperature thermistor must be lowered by 4 degrees.
Provided : 7-degree adjustment
Not provided : No adjustment

J1-7) Switch for fan speed during thermostat OFF in HEAT operation
Provided : EXTRA LOW
Not provided : LOW
J1-8) Switch for fan speed during thermostat OFF in HEAT operation.
Provided : EXTRA LOW or LOW (set with J1-7)
Not provided : Low or HIGH (set with remote controller)
J1-9) Switch for detecting abnormalities in the outdoor unit abnormality detection.
Provided : When an abnormality occurs, it is detected.
Not provided : Even if an abnormality occurs, it can not be detected.
J1-10) Switch for auto restart function
Previded : This function does not work
Not provided : This function works.

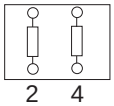
(2) SW2 (Address selector)

Used in setting the unit-address for group control.
For further information, refer to page 57.

(3) SW3 (Emergency operation switch)

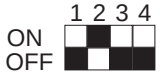



(4) J5 (Model selector)




J5-2) Prouided :For models with heat pump.
Not Previded :For models without heat pump.
J5-4) This jumper is unavailable for PKH-FK

(5) SW7




SW7-1) OFF:PKH18/24FK
ON :PKH30/36FK
SW7-2) POWER SUPPLY ( OFF: 208V / ON : 230V )

**2.11 INDOOR FAN CONTROL**

Indoor fan relay output.
(a) During fan ON
The indoor fan relay turns ON. One second later, the phase control will start.
(b) During fan OFF
The phase control turns OFF. One second later, the indoor fan relay will turn OFF.

## 3. OUTDOOR UNIT CONTROL

### 3-1 Outdoor fan control

The rotational frequency of outdoor fan is phase-controlled according to the outdoor coil temperature. This control allows the cooling operation even with the low outside-air temperature and the heating operation even with the high outside-air temperature.

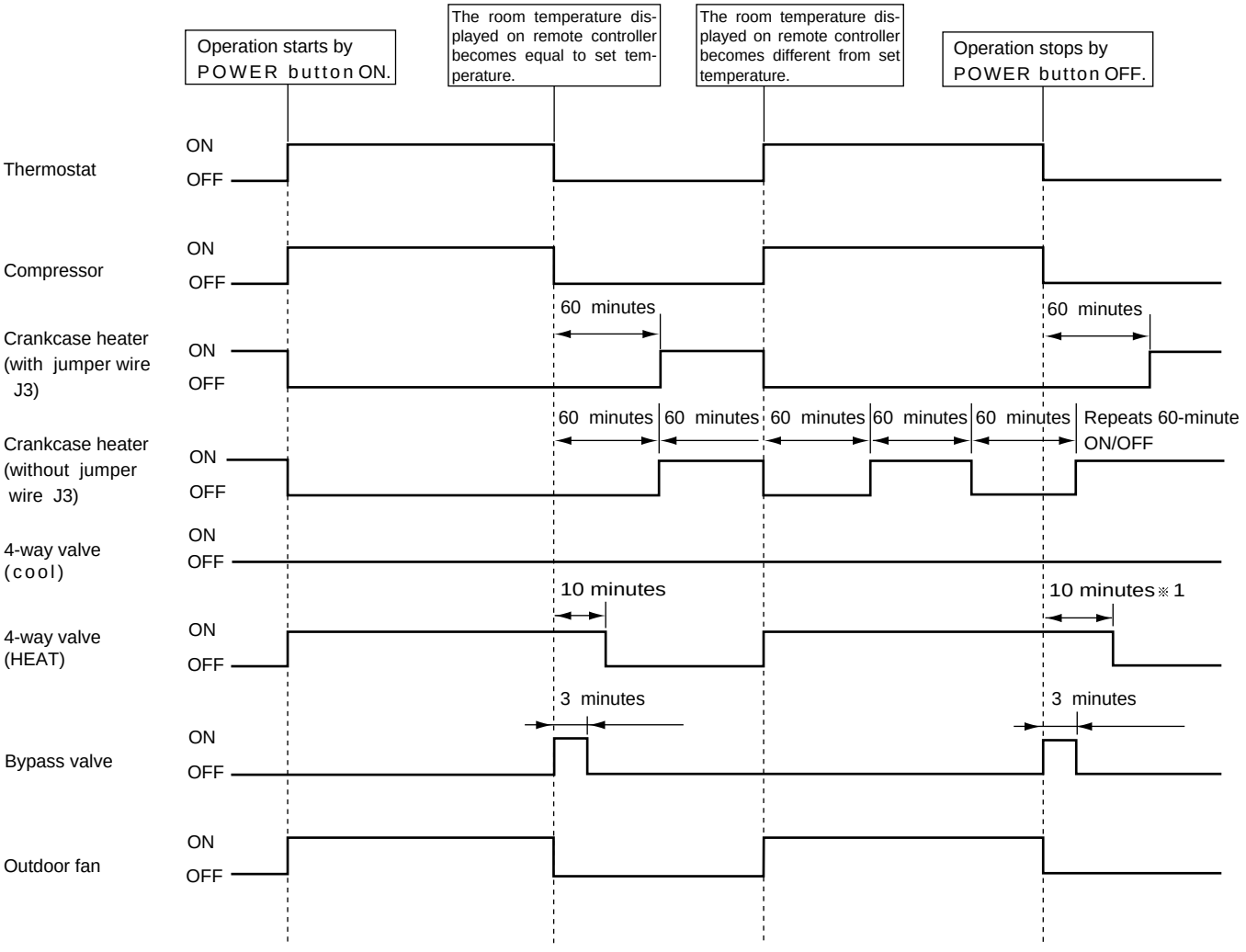
### 3-2 Outdoor unit control

The outdoor unit turns ON/OFF the cooling/heating operation according to orders given from the indoor unit.

### 3-3 Protective functions

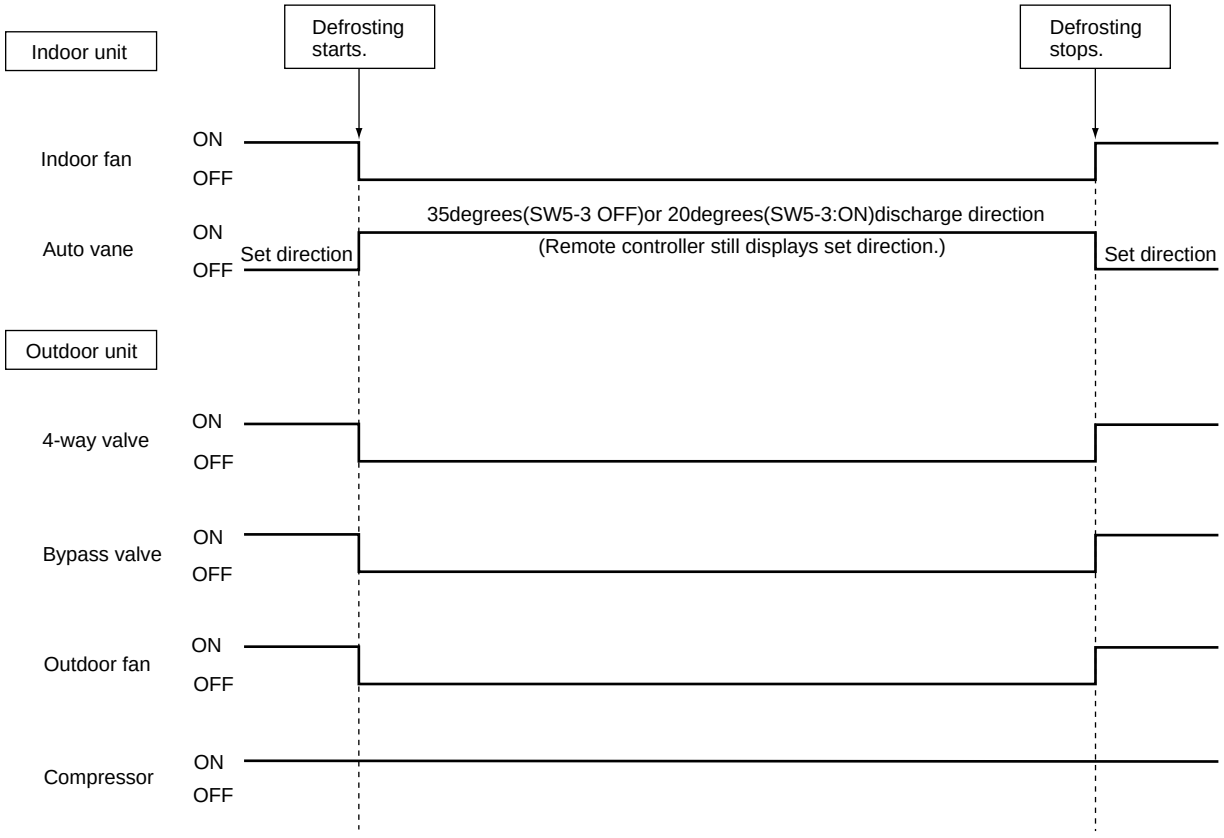
① If an reversed-phase, an open phase, or an indoor controller abnormality is detected, the outdoor unit will stop operation and the check mode will start. (For the check mode details, see page 48.)
② If a protective function works, the compressor will stop running. Three minutes later, the compressor will restart. If the protective function works again, the compressor will stop running and the check mode will start.
③ The protective function is memorized.
④ The memory is cleared when the POWER ON/OFF button on the remote controller is turned OFF. However, the check mode display continues until the outdoor unit receives the “operation ON” command from the indoor unit.

### 3-4 COOL/HEAT operation time chart




※1 If compressor restarts within 10 minuteas, 4-way valve remains ON.

### 3-5 Defrosting in HEAT mode
### <Defrosting time chart>




**(1) Start conditions**

A. When all of the following conditions are satisfied, defrosting will start. However, when the bypass valve turns OFF, defrosting starts 10 minutes later.
   (a) More than seven minutes have passed since the compressor start-up.
   (b) The outdoor coil thermistor reads 23˚F or below.
   (c) The outdoor fan motor output step is 100%
   (d) Total time of compressor operation exceeds 30 minutes, and the outdoor coil temperature has fallen by 14 degrees or more in comparison with that of 10 minutes after the compressor start-up.
   **NOTE**: The outdoor coil temperature 10 minutes after the compressor start-up is memorized until the defrosting operation has ended.

B. When all of the following conditions are satisfied, defrosting will start.
   (a) ~ (c) The same as above (a) ~ (c) in item A
   (d) Total time of compressor operation exceeds “defrost interval”.
   Further information on the defrost interval is described in (3).

C. After the total time of compressor operation exceeds the defrost interval, the thermostat repeats ON/OFF three times. Two minutes after the fourth “ON” of the thermostat, if the outdoor coil thermistor reads 23˚F or below and the fan output output is 100%, defrosting will start.
   **NOTE**: The count of the thermostat ON/OFF is cleared by the compressor-OFF command or defrosting start-up.

**(2) During defrosting**

- Even if the thermostat turns OFF, defrosting continues.
- The 4-way valve, bypass valve, outdoor fan, and indoor fan are OFF.

**(3) Defrost interval**

The defrost interval time is determined as follows.

- Initial defrost interval is 50 minutes.
- The defrost interval after defrosting depends on the preceding defrosting time as shown below.

| Defrosting operation time | Next defrost interval |
|---|---|
| 3 minutes or below | 120 minutes |
| 3 to 7 minutes | 80 minutes |
| 7 to 10 minutes | 60 minutes |
| 10 to 15 minutes | 40 minutes |
| 15 minutes (Maximum) | 30 minutes |

NOTE1:If the unit stops during defrosting , the next defrost interval will be 50 minutes.

NOTE2:If a protection function works for the first time during defrosting, the compressor will stop.
After a 3-minute time delay, defrosting will restart. In this case, a 3-minute time delay is included with the defrosting time.
If the protection function works for the second time, the unit stops operation and displays the check code.
The next defrost interval will be 30 mimutes.

NOTE3:When the defrosting has ended, the total time of the compressor operation is cleard.

**(4) Termination conditions**

Defrosting finishes when any of the following conditions are satisfied.

①Defrosting has continued for 15 munites.
②Outdoor coil thermistor reads 72˚F or above for the first 75 seconds after defrosting start-up.
③Outdoor coil thermistor reads 46˚F or above after the 75-second defrosting.
④Power ON/OFF button is turned OFF during defrosting.

**3-6 Actuators**

**(1) Bypass valve control**

<Cooling mode>

①When the unit stops due to the coil frost prevention, the bypass valve turns ON. When one hour has passed since the compressor stopped, the bypass valve returns to OFF.
②When the compressor operates with the bypass valve at ON for more than 30 minutes, the bypass valve turns OFF.
③When the compressor stops with the bypass valve at OFF, the bypass valve turns ON and remains ON for three minutes.

<Heating mode>

①When the unit starts for the first time after the circuit breaker has been turned ON, or when it starts after the compressor OFF of 30 minutes or more, if the outdoor coil thermistor reads 54˚F or more, the bypass valve turns ON.
②When the high pressure switch (63H1) works, the bypass valve turns ON.
③When the bypass has been ON for 30 minutes:
- If the high pressure switch has already returned, the bypass valve turns to OFF.
- If not, the fan output step keeps 70 for three minutes. Meanwhile, if the high pressure switch returns, the bypass valve turns OFF. Otherwise the normal fan control starts.

④When the operation mode changes or stops, the bypass valve turns ON and remains ON for three minutes.

<Defrosting operation>

①The bypass valve is OFF.

**(2) Crankcase heater control**

①With jumper wire J3
The crankcase heater is ON from when the power is turned ON until the compressor starts, and then turns ON one hour after the compressor stops.
②Without jumper wire J3
The crankcase heater is ON from when the power is turned ON until the compressor starts, and repeats 1-hour ON and 1-hour OFF.

**3-7 Service functions**

**(1) Compulsory defrositng**

①When all of the following conditions are satisfied, pressing SW2 starts the compulsory defrosting.

- During HEAT mode
- The compressor is ON.
- The outdoor coil temperature is being displayed by LED. (Outdoor controller board dip switch SW3-1 : OFF, SW3-2 : ON)
- The outdoor coil thermistor reads 46°F or below.

②The operation state and the termination conditions of the compulsory defrosting are the same as those of the normal defrosting. As an exception, the defrost interval after the defrosting completion is 50 minutes.

**(2) Fixed fan-output**

While the compressor is operating (exept during defrosting) and the fan output step is indicated by LED, pressing SW2 fixes the fan output. The fixed fan-output can be released when any of the following conditions are satisfied.

①SW2 is pressed again.
②SW3 setting is changed.
③The compressor stops.
④Defrosting operation starts.

**(3) Function of switches on the outdoor controller board**

SW1: Clears the check code memory (push-button switch)
SW2: Switches the output state indication and the check code display (push-button switch)
SW3-1,2: Switches the output state indication items (dip swtich)
For further information, refer to page 50.

**(4) 100% fan output**

Fan output is fixed to 100% by shorting the connector CN22. However, the fan stops during compressor OFF or defrosting. Open-circuit of CN22 restarts the normal fan control.

**(5) Time shorterning**

Short circuit of the connector CN21 shortens the time as follows

①Fan control period: 30 seconds → 3 seconds
②Three-minutes time delay function : 3 minites → 3 seconds
③Max. time of defrosting : 15 minites → 15 seconds
④Defrost interval : 30 ~ 120 minutes → 3 ~ 12 seconds
⑤Compressor ON/OFF time for bypass valve ON/OFF : 30 minutes → 3 seconds
⑥Compressor ON time to start other functions : x minutes → x seconds
⑦Crankcase heater operation : 1 hour → 6 seconds

# 9 TROUBLESHOOTING

## 1.TROUBLE IN TEST RUN

<table>
<tr><th>Symptom</th><th>Cause</th><th>Check points</th></tr>
<tr><td>The display “CENTRALLY CONTROLLED” on remote controller does not disappear.</td><td>1) Wrong address setting of remote controller/indoor controller board.<br>2) Timer adapter is connected to the remote controller.<br>3) Signal transmission error between indoor unit and remote controller.</td><td>1) Check the address setting of remote controller and indoor controller.<br>2) Make sure the timer adapter is used correctly.<br>3) ① Turn another remote controller’s DIP SW17-7 ON to make it sub controller.<br>② Connect the sub controller to the unit, and turn circuit breaker ON.<br>● If the display “centrally controlled” disappears, replace the original remote controller.<br>● If the display remains the same, replace the indoor controller board.</td></tr>
<tr><td>When remote controller POWER button is turned ON, the check code “EO”appears.</td><td>1) Signal transmission error between indoor unit and remote controller</td><td>1) ① Connect a sub remote controller.<br>② Turn circuit breaker ON.<br>If the display “centrally controlled” remains, replace the indoor controller board.<br>③ If the display disappears, turn the remote controller POWER button ON and check as follows.
<table>
<tr><th></th><th>Remote controller</th><th>Sub remote controller</th><th>Malfunction</th></tr>
<tr><td>1</td><td>Operating Display</td><td>EO Display</td><td>Malfunction of indoor Unit</td></tr>
<tr><td>2</td><td>Operating Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr>
<tr><td>3</td><td>NO Display</td><td>EO Display</td><td>Malfunction of indoor Unit and Remote Controller</td></tr>
<tr><td>4</td><td>NO Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr>
</table></td></tr>
<tr><td>When remote controller POWER button is turned ON, operating display appears, but disappears soon.</td><td>1) Short circuit of indoor/outdoor connecting wire<br>2) Short circuit of transmission wire.<br>3) Short circuit of drain sensor heater circuit.<br>4) Wrong operation of remote controller due to noise wave emitted by other appliances.</td><td>1), 2) Check the wire<br>3) Measure the resistance of the drain sensor connector CN50 ① - ③. Normal resistance should be 82Ω.<br>4) Turn the circuit breaker OFF, and then turn ON.<br>If the remote controller remains abnormal, despite the above measures, replace the indoor controller board.</td></tr>
<tr><td>Despite turning POWER button ON, the remote controller display does not appear.</td><td>1) Damaged remote controller.<br>2) Short circuit of transmission wire.<br>3) Bad contact of indoor CN40.<br>4) CN40 is attached to a sub unit.<br>5) Damaged transformer.<br>6) Bad contact of CN4T.<br>7) Blown fuse.<br>8) Circuit breaker OFF.</td><td>1) Measure the voltage between terminals of remote controller. If no voltage, remove the wire from the terminals and measure the voltage between wires. If the voltage is between 6VDC and 12V, replace the remote controller.<br>2) ~ 8) Check each point.<br>If it is not defective, replace the indoor controller board.</td></tr>
</table>

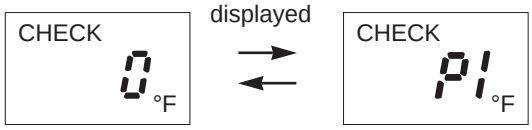
## 2. SELF DIAGNOSTIC FUNCTION WITH REMOTE CONTROLLER

### 2-1 When malfunction occurs during operation

When a malfunction occurs, the indoor and outdoor units stop and the malfunction is displayed on the LCD of the remote controller.

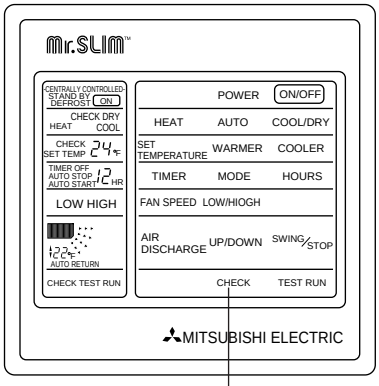
(A) ON the set temperature display part, “CHECK” appears, and the unit address and the check code are displayed alternately at one-second intervals. (Check mode)

Example




Alternately displayed

CHECK mode




CHECK button

(2) When one remote controller controls several units in the group control, the LCD shows the unit address and check code of the first malfunctioning unit.

(3) To cancel the check mode, press the POWER ON/OFF button. In remote ON/OFF control, press the remote ON/OFF switch. In centralized control, turn OFF the POWER ON/OFF button of centralized controller.

**NOTE**: The latest check code is memorized, even if the check mode is cancelled by the way mentioned above. It takes 60 seconds maximum to display the memorized check code.

### 2-2 How to use the self diagnostic function for service

**A. For normal control with one unit and one remote controller**

(1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.

(2) During the self diagnostic function, “CHECK” appears at two positions on the remote controller display. Then, at least 10 seconds later, the unit address and the check code is alternately displayed at one-second intervals.

(3) Check and repair the unit according to the check code. (Refer to the next page.)

### 2-3 For group control using one remote controller

(1) Press the WARMER or COOLER button on the remote controller to advance or go back to the unit address. Each time WARMER button is pressed, the unit address advances by one. Each time COOLER button is pressed, the unit address goes back by one.
The check code and the unit address, appear alternately.

(2) The check code “U8” means no malfunction has occurred since installation.
The check code “EO” means the following conditions:
- The unit address displayed on the remote controller does not apply to any unit.
- power is not supplied to the unit.
- Signal transmitting / receiving circuit is abnormal.

(3) Check and repair the unit according to the check code. (Refer to the next page.)

| Check code | Diagnosis of malfunction | Cause | Check points |
|---|---|---|---|
| EO | Signal transmitting/receiving error<br>(Indoor controller does not respond to remote controller signal.) | During individual unit control<br>1) Bad contact of transmission wire<br>2) Signal transmitting/receiving circuit is abnormal. | 1) Check the transmission wire.<br>2) Check with another remote controller. If “EO” is still indicated, replace the indoor controller board.<br>If other check code appears. replace the original remote controller. |
| P1 | Abnormality of room temperature thermistor (RT1) | 1) Bad contact of thermistor<br>2) Damaged thermistor | 1) Check the thermistor.<br>2) Measure the resistance of the thermistor.<br>Normal resistance should be as follows.<br>32˚F···15kΩ 86˚F··4.3kΩ<br>50˚F·····9.6kΩ 104˚F··3.0kΩ<br>68˚F·····6.3kΩ<br>If the resistance is normal, replace the indoor controller board. |
| P2 | Abnormality of indoor coil thermistor (RT2) | | |
| P3 | Signal transmission error<br>(Remote controller does not respond to indoor controller signal.) | 1) Bad contact of transmission wire<br>2) Signal transmitting/receiving circuit is abnormal.<br>3) Wrong operation due to noise wave emitted by other appliances | 1) Check the transmission wire.<br>2) Check with another remote controller.<br>If “P3” is still indicated, replace the indoor board.<br>If other check code appears, replace the original remote controller.<br>3) Short-circuit between ① and ② of CN40 and attach CN40 to the following units.<br>● Second unit in twin control<br>● Second and third units in triple control<br>● Sub units in group control |
| P4 | Abnormality of drain sensor | 1) Bad contact of transmission wire<br>2) Damaged thermistor | 1) Check the connector.<br>2) Measure the resistance of the thermistor ④ - ⑤. As for the normal resistance, refer to the case of P1.<br>If the resistance is normal, replace the indoor controller board. |
| P5 | Malfunction of drain pump | 1) Malfunction of drain pump<br>2) Damaged drain sensor | 1) Check the drain pump.<br>2) ● Check the drain sensor.<br>● Check the drain sensor heater. Normal resistance should be 82Ω.<br>If the resistance is normal, replace the indoor controller board. |
| P6 | Coil frost protection is working. | 1) Short cycle of air cycle<br>2) Dirty air filter<br>3) Damaged fan<br>4) Abnormal refrigerant | 1) Clear obstructions from the air cycle.<br>2) Clean the air filter<br>3) Check the fan.<br>4) Check the refrigerant temperature and pressure. |
| P7 | System error | 1) Wrong address-setting<br>2) Signal transmitting/receiving circuit of remote controller is abnormal.<br>3) Wrong SW6-setting | 1) Check the address-setting.<br>2) Check with another remote controller. If check code other than “P7” appears, replace the original remote controller.<br>3) Check SW6 setting. |
| P8 | Abnormality in outdoor unit | 1) Wrong wiring of indoor/outdoor connecting wire<br>2) Reversed phase<br>3) Protection device is working<br>4) Damaged outdoor coil thermistor | 1) Check the indoor/outdoor connecting wire.<br>2) Change the connection of electric wiring.<br>3) Check the protection device.<br>4) Measure the resistance of the outdoor coil thermistor. If the resistance is normal, replace the outdoor controller board. |

## 3.SERVICE DATA INDICATION BY SWITCHES ON OUTDOOR CONTROLLER BOARD

Setting dip switchs SW2 and SW3 on the outdoor controller board enables LED to show the output state and check code. Output state is shown by LED lighting, and check code by blinking.

SW1 : Turning SW1 ON clears the check code. If SW1 is turned ON while the check code is blinking , the indication changes to output state indication.

**NOTE** : SW1 is usually available independant of SW3 setting. As an exception, when the check code shows a reversed phase or an open phase during the power-on-reset state, SW1 is not available.

SW2 : SW2 is turned ON by pressing, and OFF by releasing.

When SW3-1 and SW3-2 are OFF, pressing SW2 changes indication between output state and check code alternately.

When SW2 is turned On with SW3-1 OFF and SW3-2 ON, the compulsory defrosting starts.

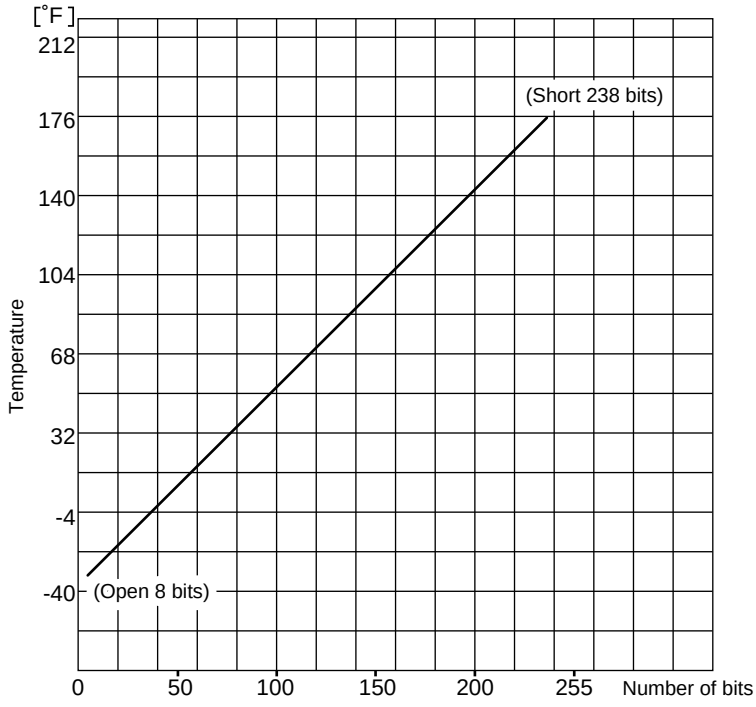
SW3 : Output state indication items depend on the combination of SW3-1 ON/OFF and SW3-2 ON/OFF.

Changed alternately by pressing SW2.

| | Check code | Output state | Outdoor coil temperature (bit) | Fan output step (bit) | Total time of compressor operation(Hr) |
|---|---|---|---|---|---|
| SW3-1 | OFF | OFF | OFF | ON | ON |
| SW3-2 | OFF | OFF | ON | OFF | ON |
| LED | Blinking | Lighting | | | |
| LD1 | Reversed phase | Compressor ON command from indoor controller | 1 | 1 | 256 |
| LD2 | Open phase | Heating operation command from indoor controller | 2 | 2 | 512 |
| LD3 | Outdoor coil thermistor is abnomal. | During 63H1 function | 4 | 4 | 1024 |
| LD4 | 63H2 function | Compressor ON | 8 | 8 | 2048 |
| LD5 | 51C function | Outdoor fan ON | 16 | 16 | 4096 |
| LD6 | 26C function | 4-way valve ON | 32 | 32 | 8192 |
| LD7 | Overheat protection | Bypass valve ON | 64 | 64 | 16384 |
| LD8 | Input circuit on controller board is abnormal | Crankcase heater ON | 128 | 128 | 32768 |

**3-1 Outdoor coil temperature**

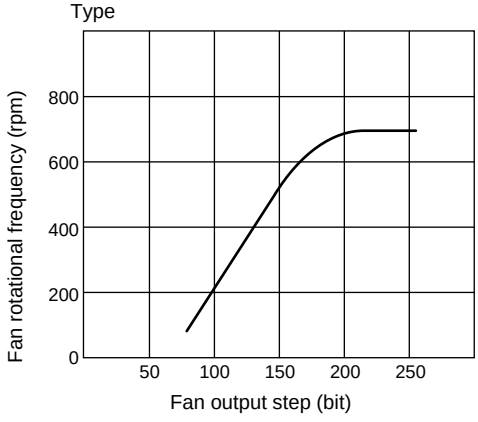
To obtain data on the outdoor coil temperature, add the number of bits of lighting LEDs, and see the graph below to find the temperature.



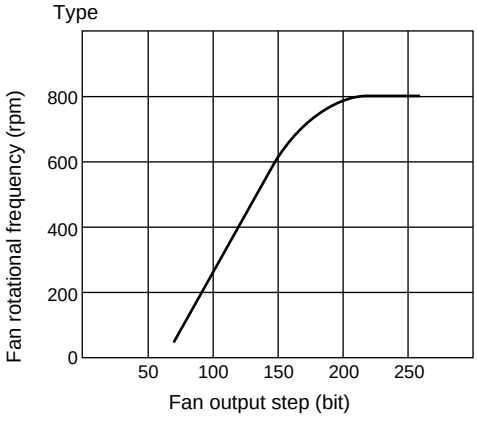

**3-2 Fan output step**

To obtain data on the fan output step, add the number of bits of lighting LEDs, and see the graph below to find the fan rotational frequency.

①PUH18/24EK




②PUH30/36EK




**3-3 Total time of compressor operation**

Compressor operation time is indicated in 256 hour units. To obtain the compressor operation time, add the hours of lighting LEDs. During the compressor operation time indication, SW2 is not available.

**3-4 Check code indication**

- When a protection function works for the first time during operation, the operation stops and restarts after the 3-minutes time delay mode. When the protection function works again, the operation stops. (Check mode) When both SW3-1 and SW3-2 are OFF, the check code is indicated.
- If the outdoor controller board receives the compressor ON command from the indoor controller board during check mode the indication changes to output state indication.
- By pressing SW2 duirng normal operation. operation will continue.
- The latest check code is indicated.

## 4. TROUBLESHOOTING ACCORDING TO CHECK CODE

| Blinking LED | Diagnosis of malfunction | Cause | Check point |
|---|---|---|---|
| LD1 | Reversed phase | Phases $A_1$, $A_2$, and $A_3$ are connected improperly. | Check the power supply connection. |
| LD2 | Open phase | ● Phase $A_2$ is open.<br>● Contact of protector, such as thermal switch, opened when power was turned on. | ● Check the power supply.<br>● Check each protector. |
| LD3 | Outdoor coil thermistor is abnormal. (Open circuit or short circuit) | ● Outdoor coil thermistor is broken.<br>● Thermistor was connected incorrectly. | ● Measure the resistance of the thermistor.<br>● Check the thermistor. If normal, replace the outdoor controller board. |
| LD4 | High pressure switch (63H2) function | ● 62H2 was badly connected.<br>● 63H2 was working. | ● Check 63H2 and the outdoor fan motor.<br>● Check if refrigerant supply is low.<br>● Check if air cycle is short-cycled. |
| LD5 | Thermal relay (51C) function | ● 51C was connected incorrectly.<br>● 51C was working. | ● Check 51C, the compressor, and power supply. |
| LD6 | Thermal switch (26C) function. | ● 26C was connected incorrectly.<br>● 26C is working. | ● Check 26C.<br>● Check if refrigerant supply is low.<br>● Check if the capillary tube is clogged. |
| LD7 | Over heat protection | ● The thermistor is broken.<br>● Coil temperature is over 153°F. | ● Measure the resistance of the thermistor.<br>● Check the outdoor fan motor.<br>● Check if air cycle is short-cycled. |
| LD8 | Input circuit of outdoor controller board is abnormal. | ● Pulse input is abnormal. | ● Replace the outdoor controller board. |

## 5.WHEN OUTDOOR UNIT DOES NOT WORK

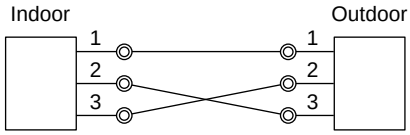
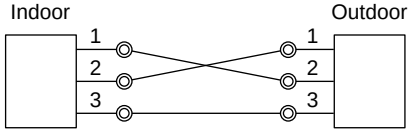
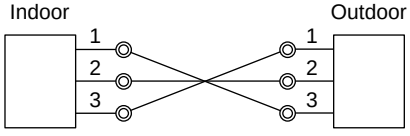
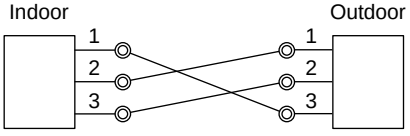
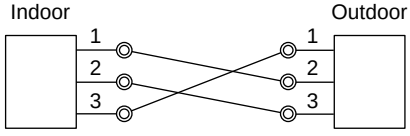
| Cause | Check points |
|---|---|
| 1) Indoor/outdoor connecting wires are poorly connected. (Refer to next page.) | 1) Check the connecting wires. |
| 2) Power supply is poorly connected. | 2) Check the power supply. |
| 3) Connector or transformer is broken. | 3) Check connectors and transformers. |
| 4) Fuse (6A) in the outdoor controller board is blown. | 4) Check the fuse. |

## 6. WRONG WIRING ON SITE

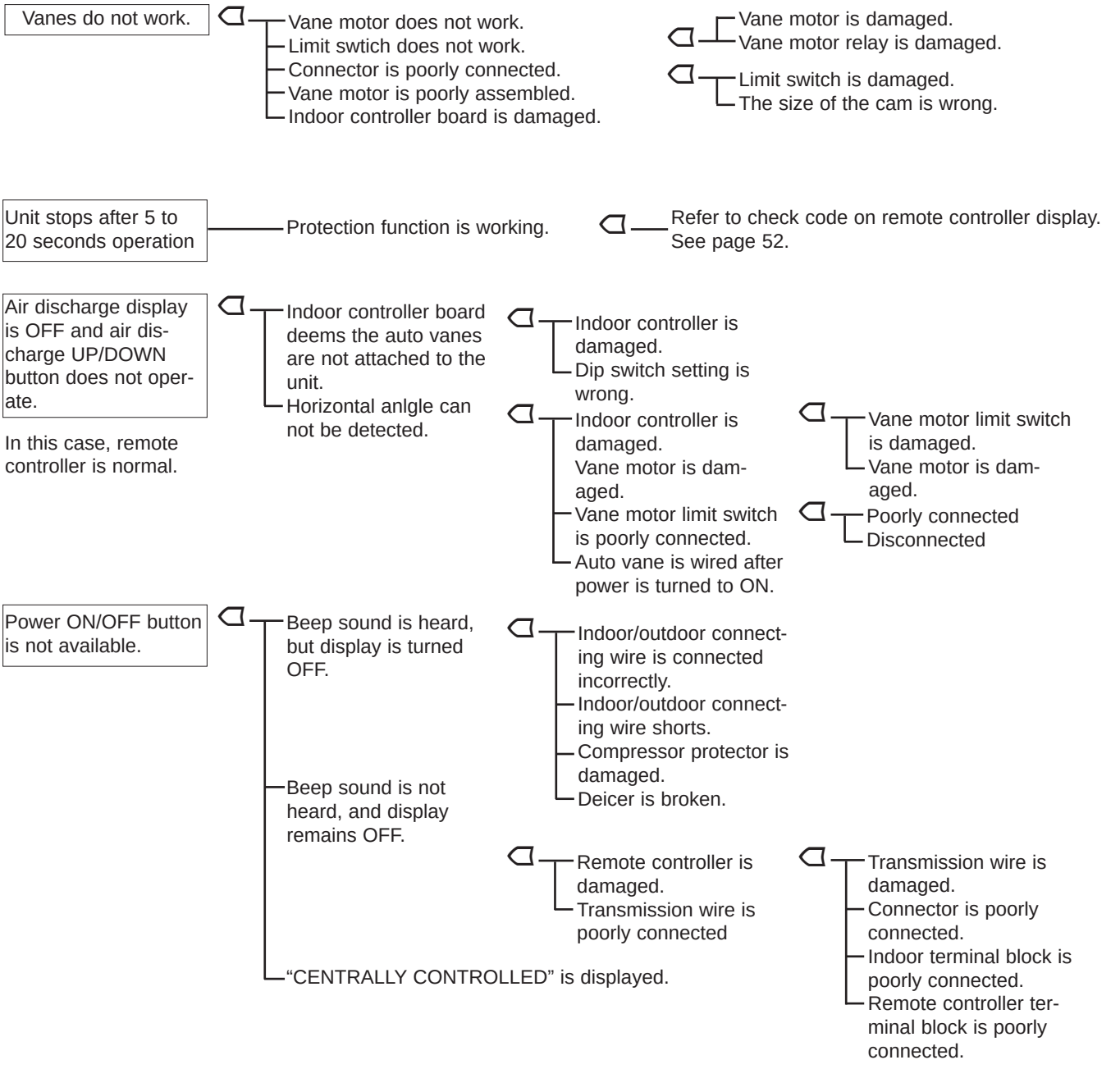
### 6-1 Between remote controller and indoor unit

If the wire is disconnected between the remote controller and the indoor unit, nothing is displayed on the remote controller when the POWER button is pressed. The beep sound will also not be heard.

### 6-2 Phenomenon due to wrong wiring between indoor and outdoor units

| Wrong wiring | Mode | Thermostat | Phenomenon |
|---|---|---|---|
|  | COOL | OFF | Operation stops. |
| | | ON | 4-Way valve turns ON. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Cooling operation. Several minutes later, check code “P8” appears on remote controller display. |
| | | ON | Normal operation. |
|  | COOL | OFF | Outdoor unit stops. |
| | | ON | Operation stops. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Operation stops. |
| | | ON | Operation stops. 27 minutes later, check code “P8” appears on remote controller display. |
|  | COOL | OFF | Outdoor unit stops. |
| | | ON | Operation stops. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Operation stops. |
| | | ON | Operation stops. 27 minutes later, check code “P8” appears on remote controller display. |
|  | COOL | OFF | Outdoor unit stops. |
| | | ON | Operation stops. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Operation stops. |
| | | ON | Operation stops, 27 minutes later, check code “P8” appears on remote controller display. |
|  | COOL | OFF | Outdoor unit stops. |
| | | ON | Operation stops. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Operation stops. |
| | | ON | Operation stops. 27 minutes later, check code “P8” appears on remote controller display. |
| Disconnection between 1 and 1 or 2 and 2. | COOL | OFF | Operation stops. |
| | | ON | Operation stops. 9 minutes later, check code “P8” appears on remote controller display. |
| | HEAT | OFF | Operation stops. 4-way valve turns OFF. |
| | | ON | 27 minutes later, check code “P8” appears on remote controller display. |
| Disconnection between 3 and 3. | COOL | — | Normal operation. |
| | HEAT | OFF | Operation stops. 4-way valve turns ON. |
| | | ON | Operation stops. 27 minutes later, check code “P8” appears on remote controller display. |

## 7. OTHER TROUBLES AND CAUSES


Vanes do not work.
Vane motor does not work.
Limit swtich does not work.
Connector is poorly connected.
Vane motor is poorly assembled.
Indoor controller board is damaged.
Vane motor is damaged.
Vane motor relay is damaged.
Limit switch is damaged.
The size of the cam is wrong.
Unit stops after 5 to 20 seconds operation
Protection function is working.
Refer to check code on remote controller display. See page 52.
Air discharge display is OFF and air discharge UP/DOWN button does not operate.
In this case, remote controller is normal.
Indoor controller board deems the auto vanes are not attached to the unit.
Horizontal anlgle can not be detected.
Indoor controller is damaged.
Dip switch setting is wrong.
Indoor controller is damaged.
Vane motor is damaged.
Vane motor limit switch is poorly connected.
Auto vane is wired after power is turned to ON.
Vane motor limit switch is damaged.
Vane motor is damaged.
Poorly connected
Disconnected
Power ON/OFF button is not available.
Beep sound is heard, but display is turned OFF.
Beep sound is not heard, and display remains OFF.
"CENTRALLY CONTROLLED" is displayed.
Indoor/outdoor connecting wire is connected incorrectly.
Indoor/outdoor connecting wire shorts.
Compressor protector is damaged.
Deicer is broken.
Remote controller is damaged.
Transmission wire is poorly connected
Transmission wire is damaged.
Connector is poorly connected.
Indoor terminal block is poorly connected.
Remote controller terminal block is poorly connected.

## 8.MR. SLIM/LOSSNAY INTERLOCK OPERATION

**<Symptoms that are not malfunctions>**

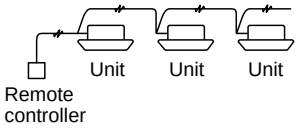
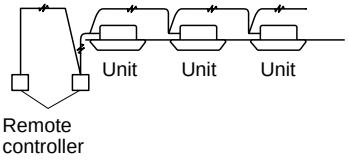
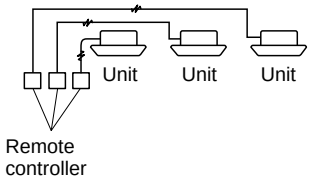
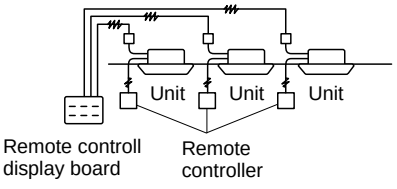
If any of the following symptoms occur, they are not malfunctions.

| Symptom | Cause |
|---|---|
| LOSSNAY control switch does not work. | LOSSNAY control switch can not work during interlock operation. LOSSNAY control switch is effective only while Mr. SLIM is not operating. |
| LOSSNAY air speed can not be controlled in interlock operation. | LOSSNAY fan speed is fixed to HIGH during interlock operation. LOSSNAY fan speed LOW/HIGH can be switched only during LOSSNAY individual operation with the LOSSNAY contorl switch. |

For LOSSNAY, troubleshooting refer to the LOSSNAY technical & service manual.

# 10 SYSTEM CONTROL

## 1. VARIETY OF SYSTEM CONTROL FUNCTIONS

| | | |
|---|---|---|
| 1 Group control with a single remote controller (See page 59.) |  | Many units, installed at different locations, can be started and controlled with a single remote controller. The remote controller can be mounted in a different location using a non-polar two-wire cable, which can be extended up to 500m. A maximum of 50 units can be controlled with a single remote controller. All units operate in the same mode. |
| 2 Control using two remote controllers (See page 60.) |  | Two remote controllers can be used to control either one unit or a group of units. Units can then be controlled from a distance or at close range. Units operate according to the latest command from either remote controller. |
| 3 Individual control by grouping remote controllers (See page 61.) |  | By grouping the remote controllers in one place, several units installed at different locations can be controlled individually, and operation conditions of all units are visible without a special control board. The control method is the same as that of the single unit with a single remote controller. |
| 4 Multiple remote control display (See page 62.)<br>✻ Multiple display adapter (PAC-SA88HA-E) is needed. |  | Several units can be controlled with a remote control display board. Operation conditions of all the units are visible with the remote control display board.<br>Individual control by each remote controller is also possible. |

## 2. GROUP CONTROL WITH A SINGLE REMOTE CONTROLLER

A maximum of 50 units can be started in order according to the dip switch settings

### 2-1 How to wire

(1) Connect the remote controller to the double terminal block on the indoor controller board of the master unit (No.0 unit). (See Figure 1.)
(2) Connect the double terminal block of the master unit to the double terminal block of No.1 unit.
(3) Connect the double terminal block of No.1 unit to the double terminal block of No.2 unit.
(4) Continue the process until all the units are connected with two-wire cables. (See Figure 2.)
(5) Remove the connector CN40 from the indoor controller board of each unit except the master unit. (See Figure 3.)
(6) Set the unit-address of each unit with SW2 on the indoor controller board following the instructions below.

**Figure 1**

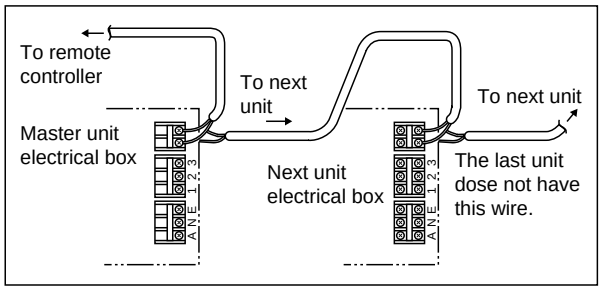
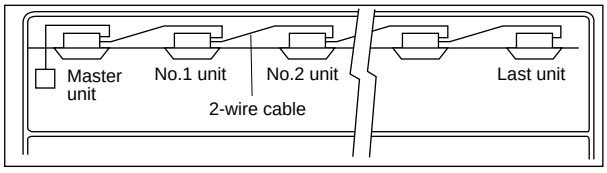

To remote controller
To next unit
To next unit
Master unit electrical box
Next unit electrical box
The last unit dose not have this wire.
A N E 1 2 3
A N E 1 2 3

**Figure 2**



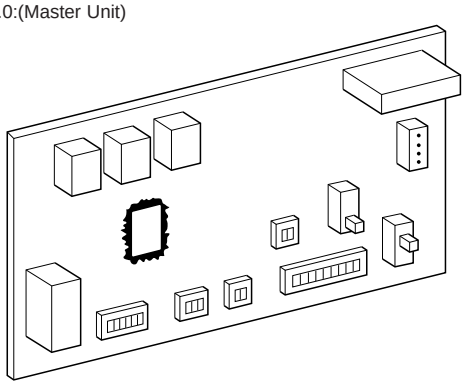

### 2-2 How to set unit-address

The unit-address also serves as a successive-start timer which starts each unit at intervals of 1 second. If two or more units have the same unit-address in a group control, operation stops due to system error. Be sure to set SW2 correctly following the instructions below.

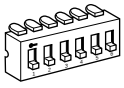
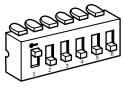
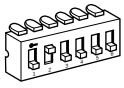
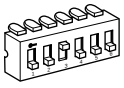
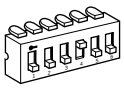
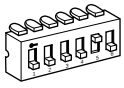
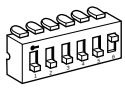
(1) Each lever of SW2 shows the number as follows.
SW2-1 : 1 SW2-4 : 8
SW2-2 : 2 SW2-5 : 16
SW2-3 : 4 SW2-6 : 32
(2) Total number of levers turned to ON shows the address of the unit.
For example, to set No.3 unit, turn ON SW2-1 and SW2-2.
(3) In this way, set from the. master unit to the last unit.
Do not forget to set the master (No. 0) unit.

**Figure 3**
Indoor controller board CN40

Should be removed from all units other than unit No.0:(Master Unit)



Setting examples

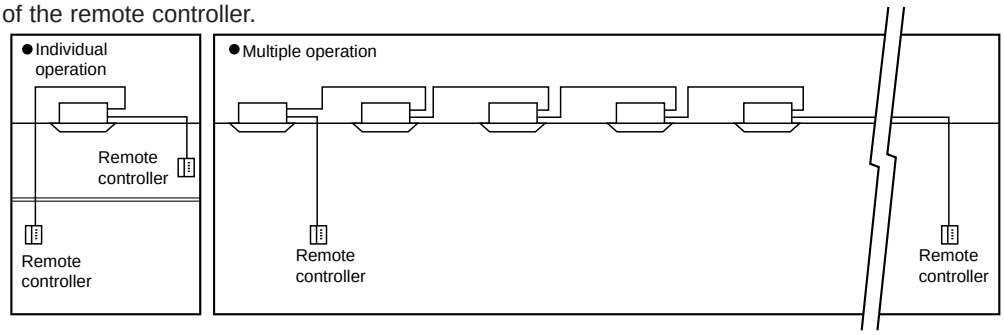
| | Master (No. 0) unit | No. 1 unit | No. 2 unit | No. 4 unit | No. 8 unit | No. 16 unit | No. 32 unit |
|---|---|---|---|---|---|---|---|
| SW2 | ALL OFF  | 1 ON  | 2 ON  | 3 ON  | 4 ON  | 5 ON  | 6 ON  |
| Unit address & start delay in seconds. | 0 | 1 | 2 | 4 | 8 | 16 | 32 |

### 2-3 Unit control

The remote controller can control all units ON/OFF, temperature,air flow, and swing louver. However, the thermostat in each unit turns ON or OFF individually to adjust to the room temperature.

## 3. CONTROL USING TWO REMOTE CONTROLLERS : OPTIONAL REMOTE CONTROLLER (PAC-SK47RC)

Two remote controllers can be used to control either one unit or a group of units. Units operate according to the latest command from either of the two remote controllers.
Before operation, be sure to set one remote controller as the "main controller" and the other as the "sub controller", using dip-switch SW17-7 of the remote controller.

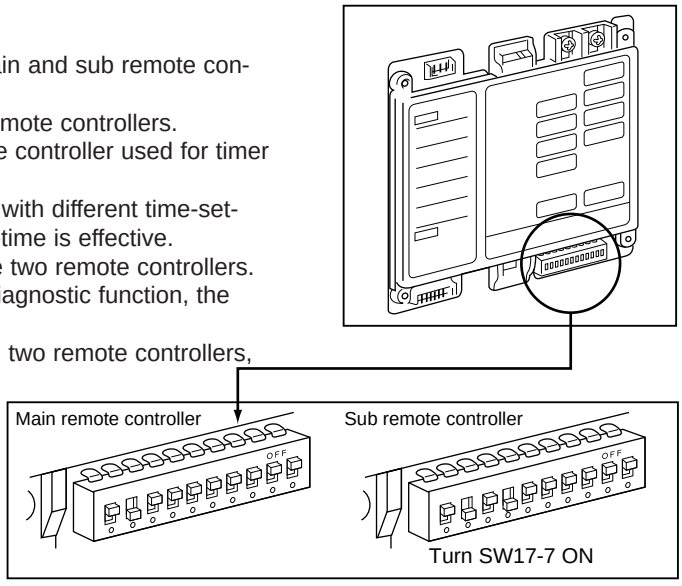



**3-1 How to set SW17-7 (See Figure 5.)**

(1) For the main remote controller, turn SW17-7 OFF.
(2) For the sub remote controller, turn SW17-7 ON.

**3-2 Remote controller LCD indication**

(1) The same indications always appear on both the main and sub remote controllers, except during the timer operations.
(2) Timer operations can be set with either of the two remote controllers. However, LCD indication appears only on the remote controller used for timer settings.
(3) If both remote controllers are set for timer operation with different time-settings, the timer operation with the shorter remaining-time is effective.
(4) Self-diagnostic function is available with either of the two remote controllers. If one of the remote controllers is used for the self-diagnostic function, the other remote controller displays the check mode.
If the self-diagnostic function is reset by either of the two remote controllers, both remote controllers are reset.



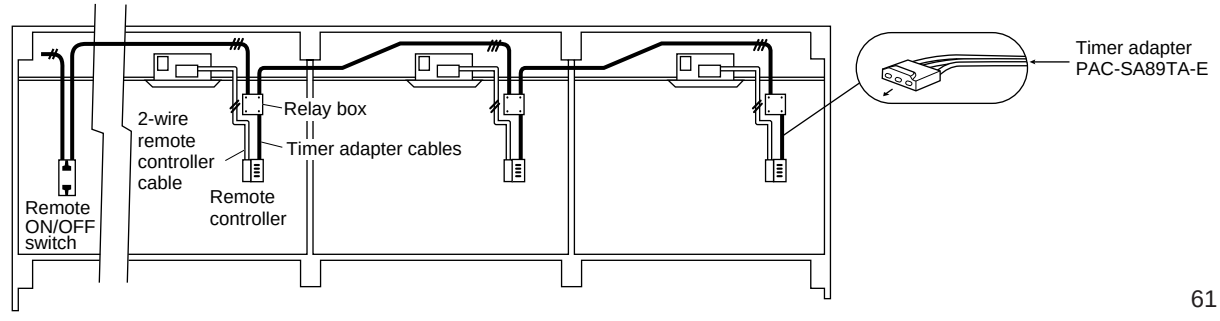

**4. REMOTE ON-OFF AND INDIVIDUAL REMOTE CONTROLS**

This method is auailable to control one unit or any number of units.
The following operations are available by connecting a relay, a timer adapter (PAC-SA89TA-E), and a remote ON/OFF switch to the system. Timer adapter is an optional part. Other parts are available on the market.
(A) To start all units in order by remote ON-OFF switch
(B) To stop all units simultaneously by remote ON-OFF switch
(C) To switch between the remote ON-OFF control and the individual remote control

**4-1 System**

Figure 6 shows the case of three units.The same is the case with any number of units.

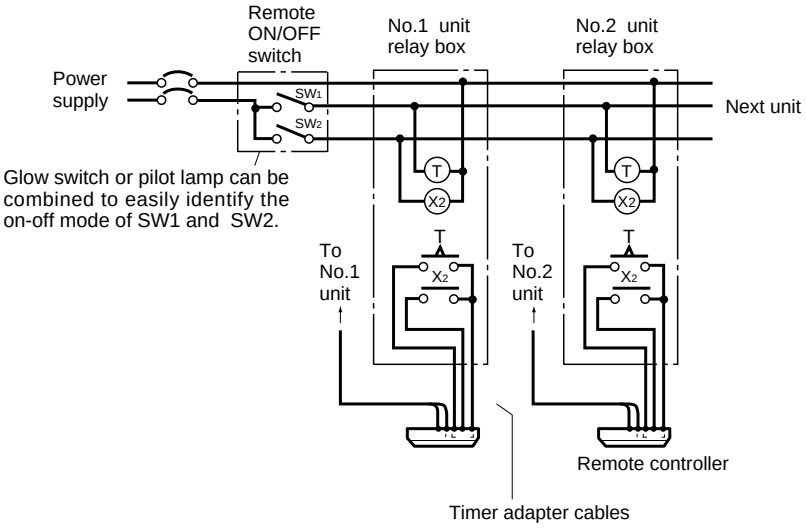
Figure 6



NOTE1 : Install the relay box where it can be serviced easily.
NOTE2 : For control circuit wiring, use a wire of No. 14 AWG or a control cable according to the power supply of control circuit.
NOTE3 : When the power supply of the control circuit is 220/240V AC,
- Do not connect the control circuit wire to the remote controller cable directly.
- Do not place the control circuit wire and the remote controller cable into the same conduit.

**4-2 Basic wiring**

Caution : Before starting all units simultaneously by the remote ON-OFF switch, be sure to connect a sequence-start timer into the remote ON-OFF circuit. Otherwise, a rush of starting current may damage the power supply.



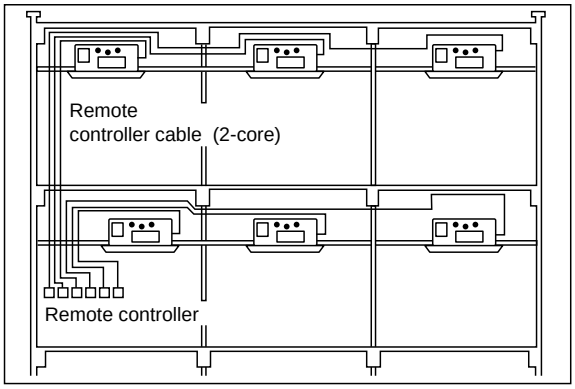

**4-3 Switch function of remote ON-OFF switch**

| | | SW2 (Switches between remote ON-OFF and individual control) | |
|---|---|---|---|
| | | ON (Remote ON-OFF control) | OFF (Individual control) |
| SW1 (Switches between remote ON and OFF.) | ON (Start) | All units start together. ※1 Individual control is not available. | Each unit can be controlled by each remote controller. Remote ON-OFF switch is not available. |
| | OFF (Stop) | All units stop together. ※2 Individual control is not available. | |

※1 After all units start together, if SW2 is turned OFF, each unit can be individually stopped by each remote controller.
※2 After all units stop together, if SW2 is turned OFF, each unit can be individually started by each remote controller.

**5. INDIVIDUAL CONTROL BY GROUPING THE REMOTE CONTROLLERS**

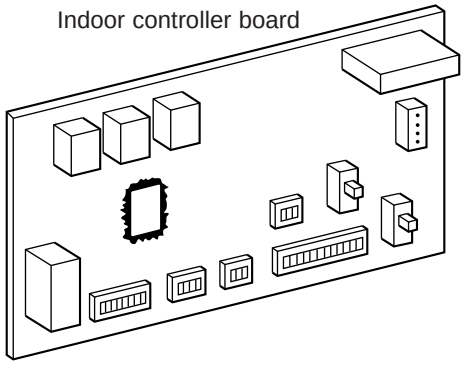
- Grouping the remote controllers allows individual control and centralized monitoring of units installed in different places without a special control board.
- Remote control cables are extendable up to 500m. When the cable length exceeds 12m, use the double-insulated two-core cable such as Belden 9407. Also, the cable thickness must be No. 22 AWG or above.
- When gathering the power ON/OFF switches of air conditioners near the remote controllers, you should also install the power ON/OFF switch near each unit to prevent electric trouble during servicing.



## 6. MULTIPLE REMOTE CONTROL DISPLAY

You can control serveral units with a multiple remote control display,by wiring an optional multipe display adapter (PAC-SA88HA-E) with relays and lamps on the market.

Indoor controller board

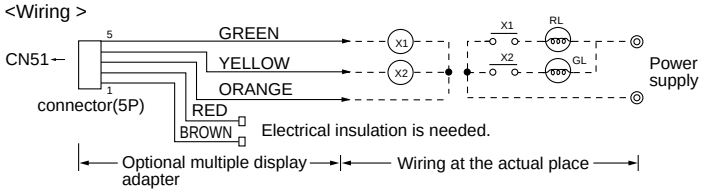


### 6-1 How to wire

(1) Connect the multipe display adapter to the connector CN51 on the indoor controller board.

(2) Wire three of the five wires from the multiple display adapter as shown in the figure below.

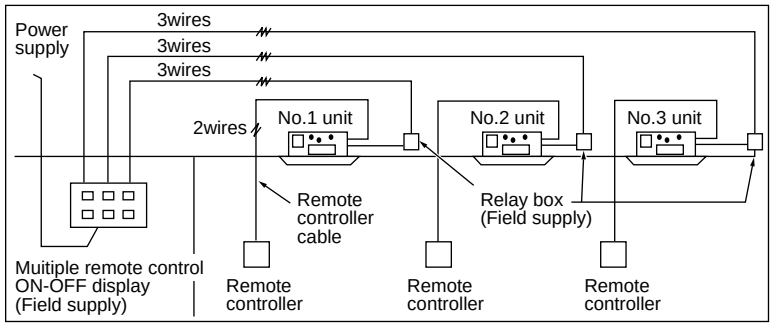
<Wiring >




The maximumdistance between indoor board and relay is 10m.

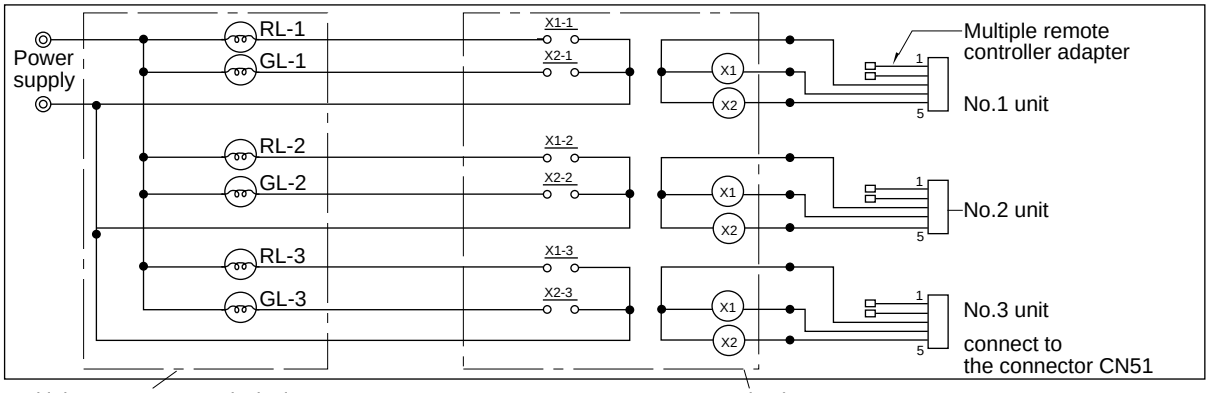
[Notes on Signs]
X1:Relay (for check lamp)
X2:Relay (for operation lamp)
RL:Check Lamp
GL:Operation Lamp
[Field supplied parts]
Relays:12V DC with rated coil power consumption below 0.9W.
Lamps:Matching to power supply voltage.

<System>



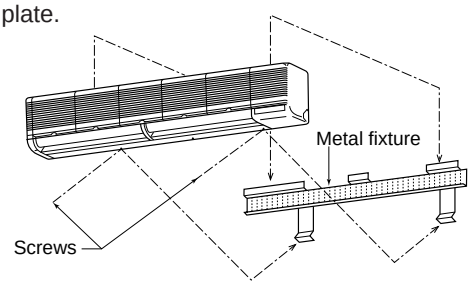
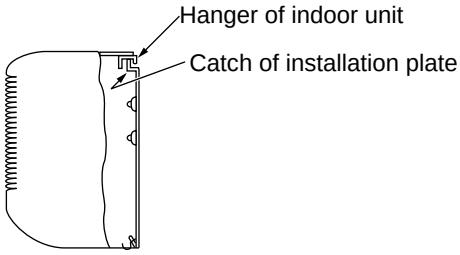
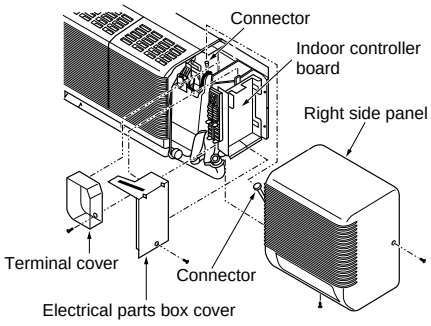
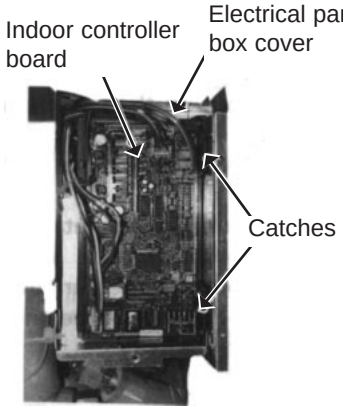
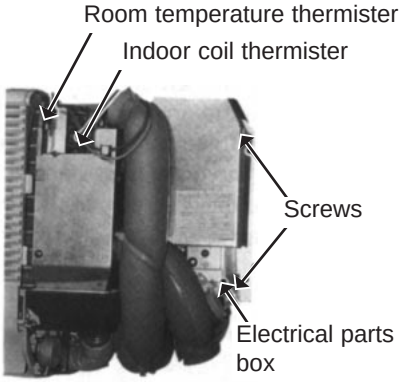

(Operation check)

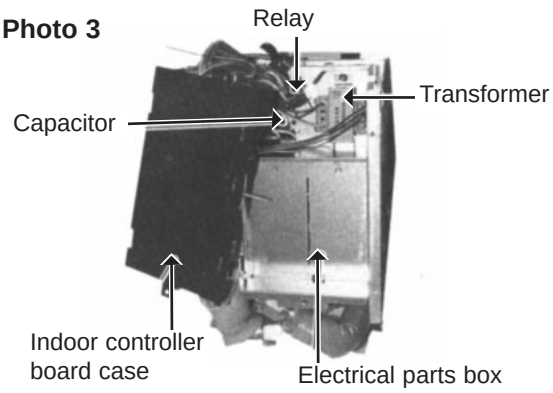
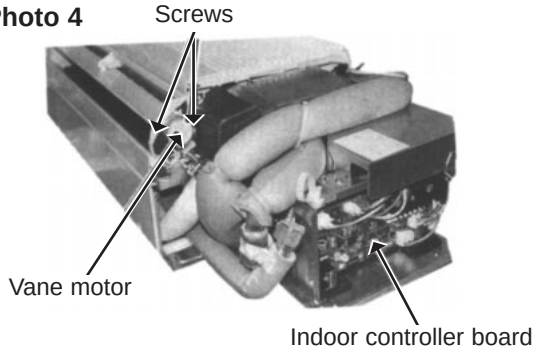
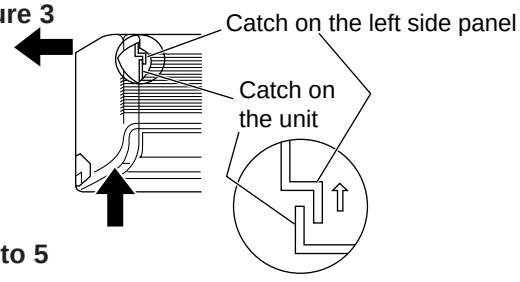
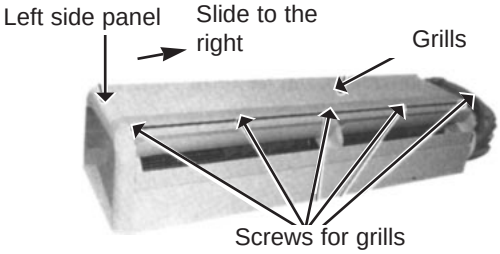
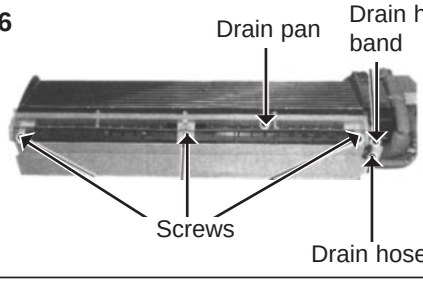
<Wiring diagram>



# 11 DISASSEMBLY INSTRUCTIONS

**Indoor unit PKH24FK**

| OPERATING PROCEDURE | PHOTOS&ILLUSTRATION |
|---|---|
| **1. Removing the lower side of the indoor unit from the installation plate**<br>(1) Remove the 2 screws.<br>Hang the indoor unit hangers to the catches on the installation plate.<br>  | **Figure 1**<br>  |
| **2. Removing the right side panel**<br>(1) Remove the 2 screws of the right side panel:one on the bottom and the other on the upper right-hand side.<br>(2) Disconnect the connector from the adapter case.<br>(3) Sliding the right side panel to the right, pull it out toward you. | **Figure 2**<br>  |
| **3. Removing the indoor controller board**<br>(1) Remove the right side panel.<br>(2) Remove the screw of the electrical parts box cover, and remove the cover.<br>(3) Disconnect the connectors on the indoor controller board.<br>(4) To unhook the catches on the right-hand side of the indoor controller board, pull the left-hand side toward you and lift up the cover to the right. Then the indoor controller board can be removed. | **Photo 1**<br>  |
| **4. Removing the ielectrical parts box**<br>(1) Remove the right side panel.<br>(2) Remove the screw of the electrical parts box cover, and remove the cover.<br>(3) Remove the room temperature thermistor and the indoor coil thermistor.<br>(4) Disconnect the vane motor connector on the indoor controller board.<br>(5) Remove the 2 screws of the electrical parts box.<br>(6) Disconnect the connector of the heater lead wire connector.<br>(7) Disconnect the connector of the fan motor lead wire.<br>(8) Remove the electrical parts box. | **Photo 2**<br>  |

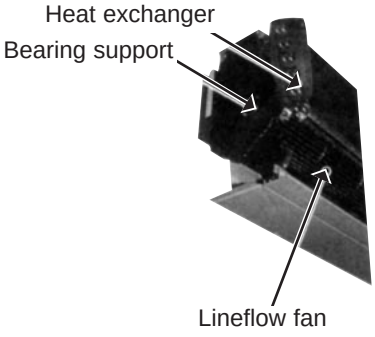
| OPERATING PROCEDURE | PHOTOS&ILLUSTRATION |
|---|---|
| (8) Remove the screws of the indoor controller board case, and pull out the indoor controller board case.<br>Then the transformer and the capacitor and relay can be serviced. | **Photo 3**<br>  <br> |
| **5. Removing the vane motor**<br>(1) Remove the right side panel.<br>(2) Remove the screw of the electrical parts box cover, and remove the cover.<br>(3) Remove the 2 screws of the vane motor, and remove the motor from the shaft.<br>(4) Disconnect the vane motor connector on the indoor controller board. | **Photo 4**<br>  <br> |
| **6 Removing the intake grills**<br>(1) Remove the right side panel.<br>(2) To remove the left side panel, remove the screw on the bottom and the screw on the upper left-hand side. (See Figure 3.)<br>1. Press up this side of the left side panel to unhook the catch on the panel from the catch on the unit.<br>2. Slide the left side panel to the left to remove the panel.<br>Note: Fix the unit to the metal fixture securely<br>(3) Remove the air filters.<br>(4) Hold and press the center cover to remove.<br>(5) Remove the screws of the grills.<br>(6) Pull the lower side of the grill toward you and slide the upper to the right to remove the grills. | **Figure 3**<br>  <br><br>**Photo 5**<br>  <br> |
| **7. Removing the drain pan**<br>(1) Remove the left and right side panels.<br>(2) Remove the grills.<br>(3) Remove the electrical parts box cover.<br>(4) Loosen the drain hose band to remove.<br>(5) Remove the 3 screws of the drain pan, and slide the drain pan toward you to remove. | **Photo 6**<br>  <br> |

## OPERATING PROCEDURE

**8. Removing the lineflow fan and the fan motor**

(1) Remove the left and right side panels.
(2) Remove the grills.
(3) Remove the electrical parts box.
(4) Remove the drain pan.
(5) Loosen the screw that fixes the lineflow fan to the fan motor. (See Photo 7. )
(6) Remove the 4 screws of the motor fixture, and remove the fan motor and the motor fixture at a time (See Photo 8.)
(7) Remove the screws of the left and right motor supports, and remove the motor supports and the fan motor. (See Photo 9.)
(8) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
(9) Remove the screw of the center support, and remove the support. (See Photo 10. )
(10) Pull the left-hand side of the heat exchanger toward you, and remove the lineflow fan.

**Photo 11**




**9. Removing the electrical heater.**

(1) Remove the left and right side panels.
(2) Remove the grills.
(3) Remove the drain pan.
(4) Loosen the screw that fixes the lineflow fan to the fan motor.(See Photo 7.)
(5) Remove the screw of the center support, and remove the support. (See Photo 10.)
(6) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
(7) Pull the left-hard side of the heat exchanger toward you, and remove the lineflow fan.
(8) Remove the heater fixing screws (1 screw each on right and left sides), and slide the heater element to the left to remove the heater.

## PHOTOS

**Photo 7**

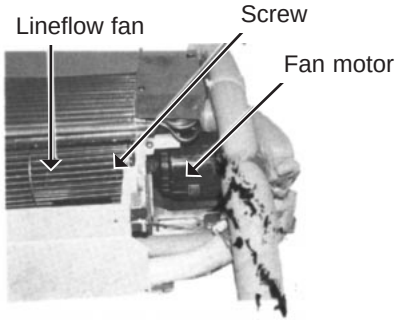



**Photo 8**

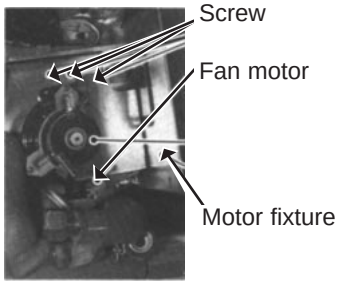



**Photo 9**

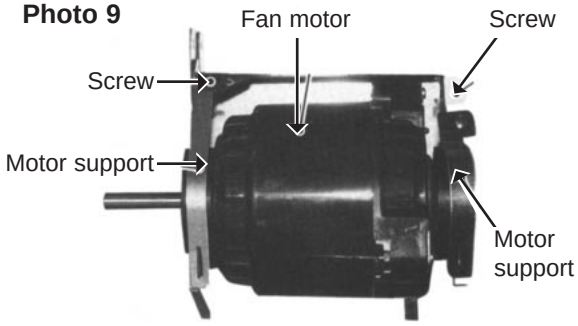



**Photo 10**

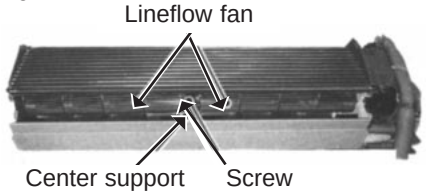
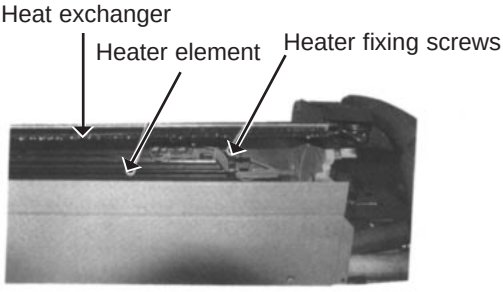
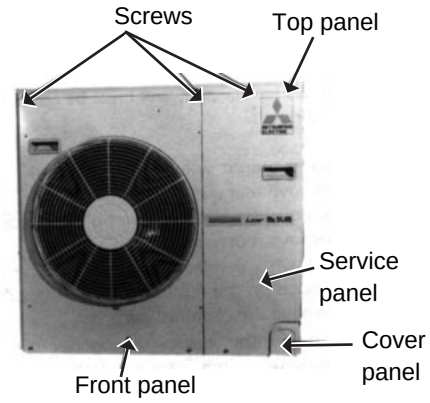
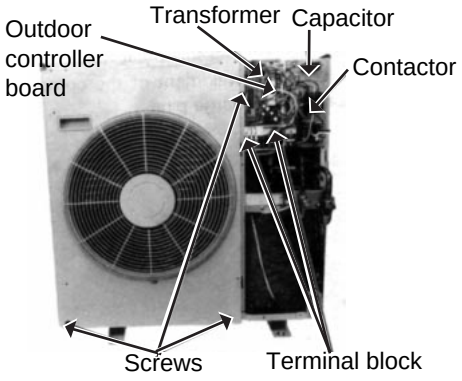
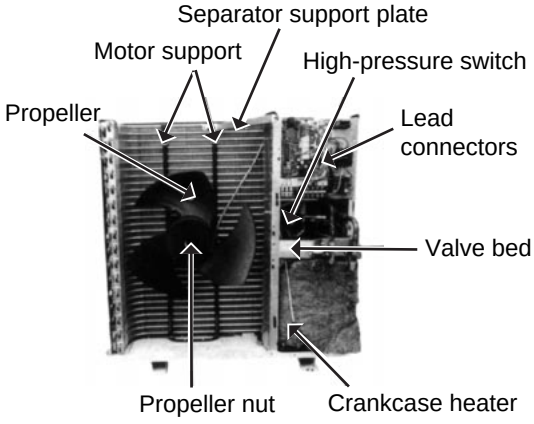
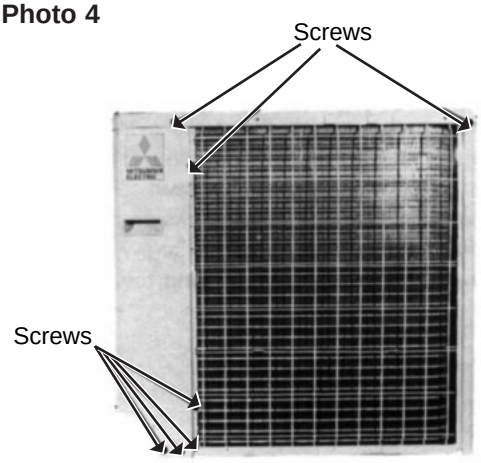
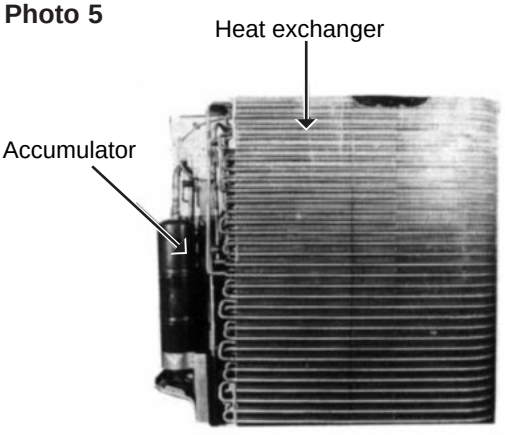
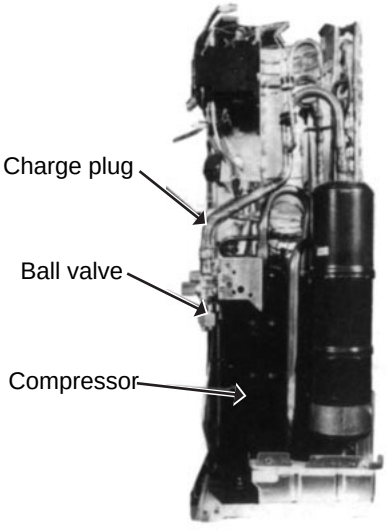



**Photo 12**

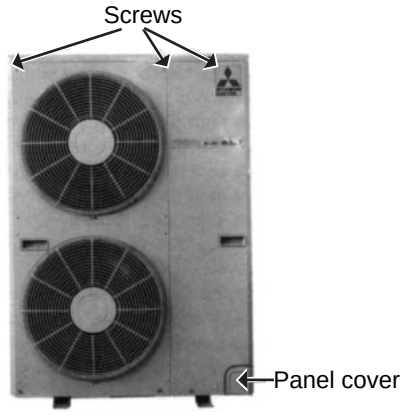
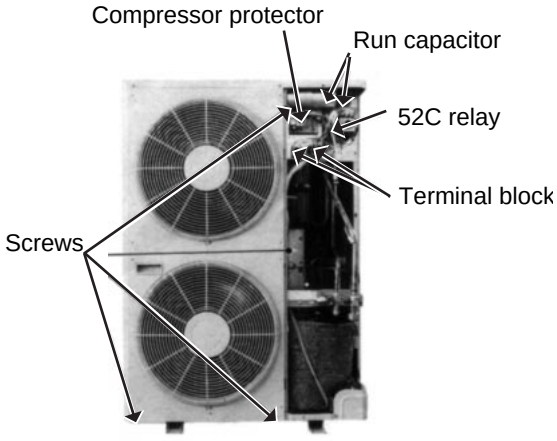
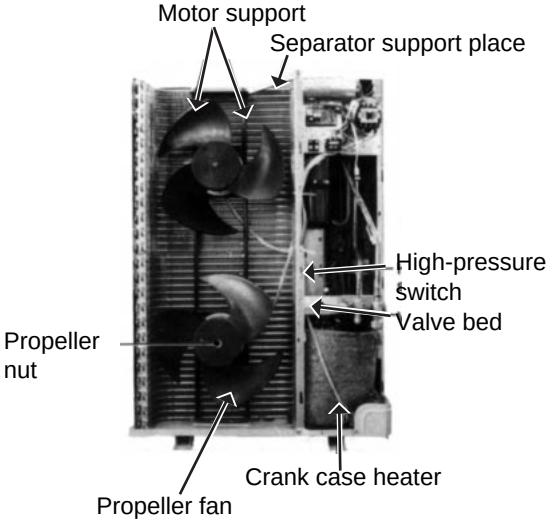


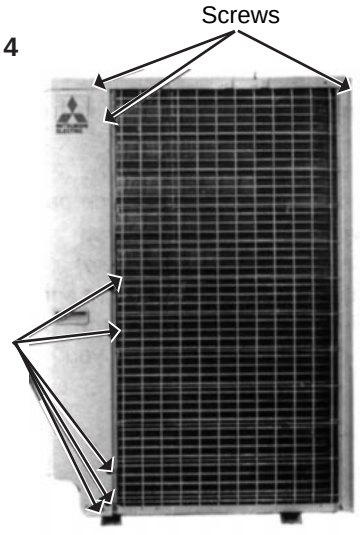
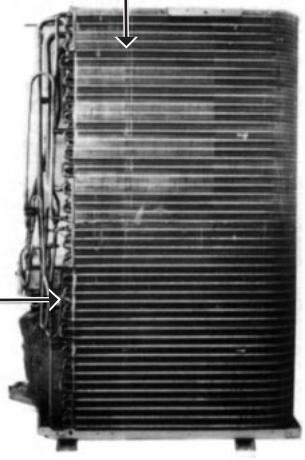
## 13-4 Outdoor unit (PUH18EK)

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **1. Electrical parts**<br>(1) Remove top panel (3 screws in front, 2 screws in rear)<br>(2) Remove cover panel (1 screw).<br>The panel is anchored by clicks to the side panel. Remove by pulling towards you.<br>(3) Remove cover panel (1 screw).<br>The panel is anchored by clicks on the right and left sides. After removing the screw, pull the panel down and remove it by pulling towards you. | **Photo 1**<br>  <br><br>**Photo 2**<br>  <br> |
| **2. Fan motor**<br>(1) Remove front panel (3 screws).<br>Open the panel to a 45 degree angle and lift to remove. The panel is clasped at three points on the left side.<br>(2) Remove propeller (1 set nut).<br>(3) Remove fan motor (3 screws).<br>Remove lead connectors. | **Photo 3**<br>  <br> |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **3. Heat Exchanger, Compressor**<br>(1) Remove the rear panel (2 screws in front, 1 screw on the side, 3 screws in the rear). Remove the valve bed, and open the rear panel to the rear to remove.<br>**NOTE :**<br>All panels are clasped, and must be removed by shifting up and down.<br><br>(2) Remove right side panel (4 screws).<br>(3) Remove rear guard (3 screws).<br>(4) Remove separator support plate (4 screws).<br>(5) Remove motor support (2 screws).<br>(6) Remove valve bed (5 screws). The valve bed is clasped on the right and left sides. Lift to remove.<br>(7) Remove the electrical parts box.<br>Remove the respective connectors from highpressure switch, crank case heater, shell thermo, and fan motor lead.<br>(8) Remove separator (2 screws).<br>(9) Remove heat exchanger (2 screws).<br>Disconnect the welded section of pipe.<br>(10) Remove compressor (3 set nuts).<br>Remove the weldment of the compressor suction pipe and discharge pipe. | **Photo 4**<br>  <br><br>**Photo 5**<br>  <br><br>**Photo 6**<br>  <br> |

## 13-5 Outdoor unit (PUH24EK)

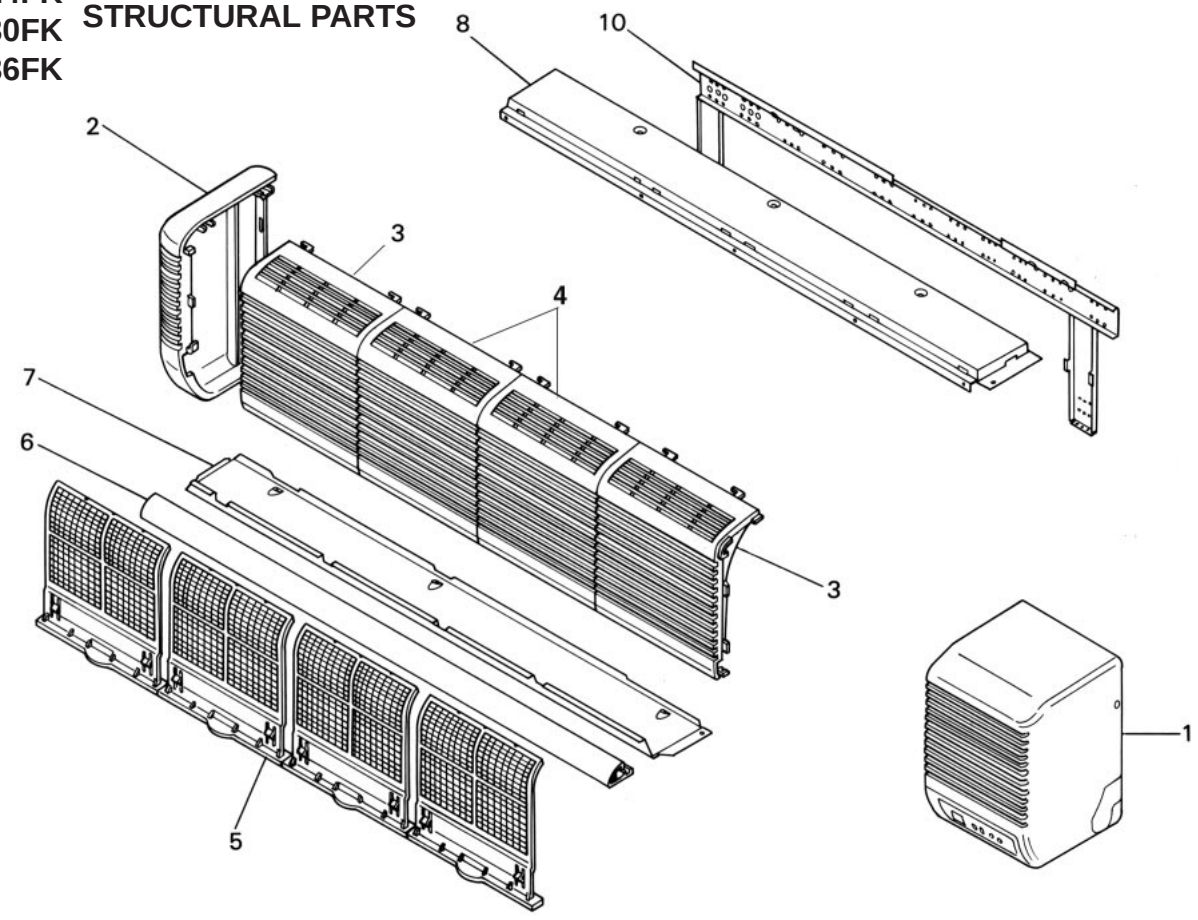
| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **1. Electrical parts**<br>(1) Remove top panel (3 screws in front, 2 screws in rear)<br>(2) Remove cover panel (1 screw).<br>The panel is anchored by clicks to the side panel. Remove by pulling towards you.<br>(3) Remove cover panel (1 screw).<br>The panel is clasped on the right and left sides. After removing the screw, pull the panel down and remove it by pulling towards you. | **Photo 1**<br>  <br><br>**Photo 2**<br>  <br> |
| **2. Fan motor**<br>(1) Remove front panel (3 screws).<br>Open the panel to a 45 degree angle and lift to remove. The panel is clasped at three points on the left side.<br>(2) Remove propeller (1 set nut).<br>(3) Remove fan motor (3 screws).<br>Remove lead connectors. | **Photo 3**<br>  <br> |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **3. Heat Exchanger, Compressor**<br>(1) Remove the rear / right side panel (2 screws in front, 1 screw on the side, 3 screws in the rear).<br>Remove the electrical box, valve bed, and open to the rear to remove (anchors attached).<br>(2) Remove right side panel (4 screws).<br>(3) Remove rear guard (3 screws).<br>(4) Remove separator support plate (4 screws).<br>(5) Remove motor support (2 screws).<br>(6) Remove valve bed (5 screws). The valve bed is clasped on the right and left sides. Lift to remove.<br>(7) Remove the electrical parts box.<br>Remove the respective connectors from highpressure switch, Low-pressure switch, crank case heater, shell thermo, and fan motor lead.<br>(8) Remove separator (2 screws).<br>(9) Remove heat exchanger (2 screws).<br>Remove piping weld zone.<br>(10) Remove compressor (3 set nuts).<br>Remove the weldment of the compressor suction pipe and discharge pipe.<br>**NOTE :**<br>All panels are clasped, and must be removed by shifting up and down. | **Photo 4**<br>  <br><br>**Photo 5**<br>  <br><br>**Photo 6**<br> <br> |

# 12 PART LIST

**PKH18FK**
**PKH24FK**
**PKH30FK**
**PKH36FK**

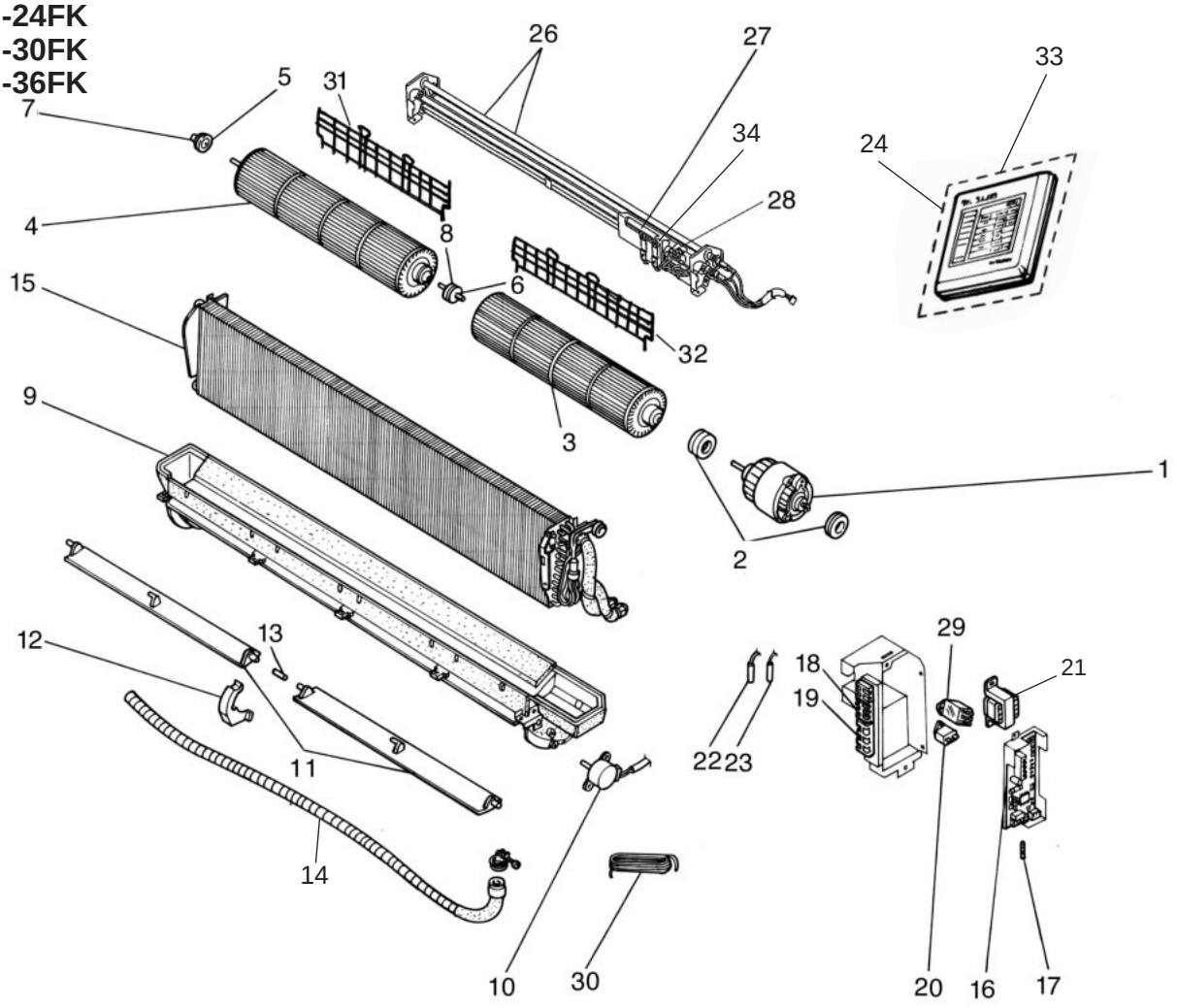
## STRUCTURAL PARTS




**Part number that are circled not shown in the figure.**

| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|---|---|
| | | | | PKH | | | | | |
| | | | | 18FK | 24FK | 30FK | 36FK | | |
| 1 | R01 12G 661 | RIGHT SIDE PANEL | | 1 | 1 | 1 | 1 | | |
| 2 | R01 12G 662 | LEFT SIDE PANEL | | 1 | 1 | 1 | 1 | | |
| 3 | R01 12G 691 | INTAKE GRILLE | | 2 | 2 | 2 | 2 | | |
| 4 | R01 16G 692 | | | | | 1 | 1 | | |
| 5 | R01 12G 500 | AIR FILTER | | 4 | 4 | 5 | 5 | | |
| 6 | R01 12G 811 | NOSE | | 1 | 1 | | | | |
| | R01 16G 811 | | | | | 1 | 1 | | |
| 7 | R01 12G 812 | UNDER PLATE | | 1 | 1 | | | | |
| | R01 16G 812 | | | | | 1 | 1 | | |
| 8 | R01 12G 641 | TOP PLATE | | 1 | 1 | | | | |
| | R01 16G 641 | | | | | 1 | 1 | | |
| ⑨ | R01 12G 523 | DRAIN SOKET | | 1 | 1 | 1 | 1 | | |
| 10 | R01 12G 808 | BACK PLATE | | 1 | 1 | | | | |
| | R01 16G 808 | | | | | 1 | 1 | | |

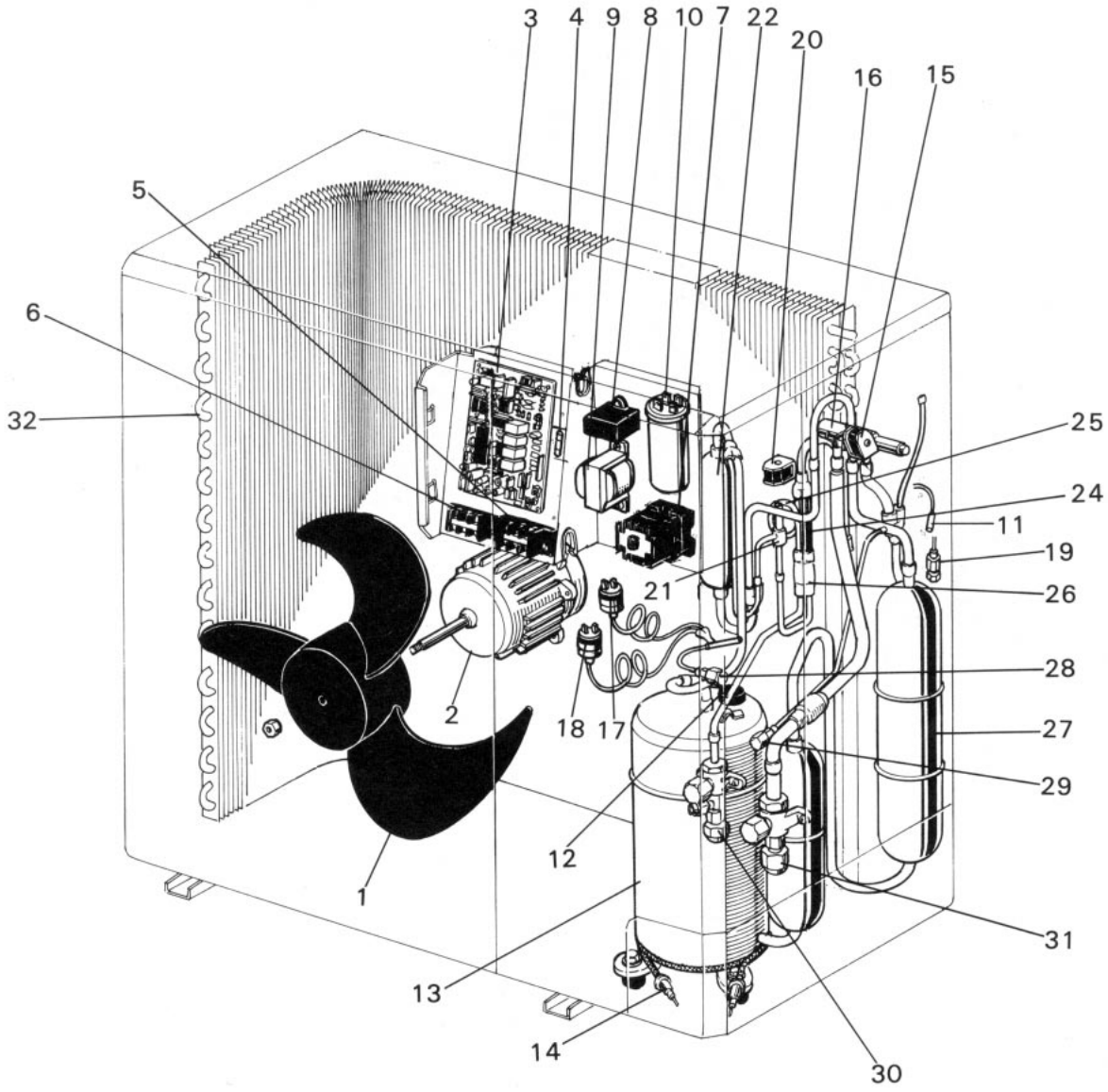
**PKH-18FK**
**PKH-24FK**
**PKH-30FK**
**PKH-36FK**




| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|---|---|
| | | | | PKH | | | | | |
| | | | | 18FK | 24FK | 30FK | 36FK | | |
| 1 | T7W BOO 762 | FAN MOTOR | | 1 | 1 | | | | MF |
| | T7W B01 762 | | | | | 1 | 1 | | MF |
| 2 | R01 12G 105 | RUBBER MOUNT | | 2 | 2 | | | | |
| | R01 16G 105 | | | | | 2 | 2 | | |
| 3 | R01 12G 115 | RIGHT LINEFLOW FAN | | 1 | 1 | | | | |
| | R01 16G 115 | | | | | 1 | 1 | | |
| 4 | R01 12G 114 | LEFT LINEFLOW FAN | | 1 | 1 | | | | |
| | R01 16G 114 | | | | | 1 | 1 | | |
| 5 | R01 005 103 | SLEEVE BEARING | | 1 | 1 | 1 | 1 | | |
| 6 | R01 12G 103 | | | 1 | 1 | 1 | 1 | | |

| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|---|---|
| | | | | PKH | | | | | |
| | | | | 18FK | 24FK | 30FK | 36FK | | |
| 7 | R01 Z61 102 | BEARING MOUNT | | 1 | 1 | 1 | 1 | | |
| 8 | R01 KV5 102 | | | 1 | 1 | 1 | 1 | | |
| 9 | T7W B02 529 | DRAIN PAN | | 1 | 1 | | | | |
| | T7W B03 529 | | | | | 1 | 1 | | |
| 10 | R01 12G 223 | VANE MOTOR | | 1 | 1 | 1 | 1 | | MV |
| 11 | R01 12G 002 | AUTO VANE | | 2 | 2 | | | | |
| | R01 16G 002 | | | | | 2 | 2 | | |
| 12 | R01 12G 621 | CENTER COVER | | 1 | 1 | 1 | 1 | | |
| 13 | R01 12G 063 | JOINT SHAFT | | 1 | 1 | 1 | 1 | | |
| 14 | R01 KV5 527 | DRAIN HOSE | | 1 | 1 | 1 | 1 | | |
| 15 | T7W B02 480 | HEAT EXCHANGER | | 1 | 1 | | | | |
| | T7W B03 480 | | | | | 1 | 1 | | |
| 16 | T7W B05 310 | CONTROLLER BOARD | | 1 | 1 | 1 | 1 | | I.B |
| 17 | T7W 410 239 | FUSE | 250V 6A | 2 | 2 | 2 | 2 | | F1.2<I.B> |
| 18 | R01 377 246 | TERMINAL BLOCK | 3P(1, 2, 3) | 1 | 1 | | | | TB2 |
| 19 | R01 998 246 | | 2P(L1, L2) | 1 | 1 | 1 | 1 | | TB4 |
| 20 | R01 A00 255 | RUN CAPACITOR | 2.5μF 440V | 1 | 1 | 1 | 1 | | C |
| 21 | T7W B02 799 | TRANSFORMER | | 1 | 1 | 1 | 1 | | T |
| 22 | R01 06A 202 | THERMISTOR | | 1 | 1 | 1 | 1 | | RT1 |
| 23 | R01 22A 202 | | INDOOR COIL | 1 | 1 | 1 | 1 | | RT2 |
| 24 | T7W 417 200 | REMOTE CONTROLLER | | 1 | 1 | 1 | 1 | | R.B |
| 25 | R01 556 246 | TERMINAL BLOCK | 2P(1/2) | 1 | 1 | 1 | 1 | | TB5 |
| 26 | T7W 587 300 | HEATER ELEMENT | 240V 700W | 3 | 3 | | | | H |
| | T7W 589 300 | | 240V 800W | | | 3 | 3 | | H |
| 27 | T7W B00 700 | THERMAL SWITCH | | 1 | 1 | 1 | 1 | | 26H |
| 28 | R01 12G 706 | THERMAL FUSE | 117°C 10A 250V | 2 | 1 | | | | FS1.2 |
| | T7W 589 706 | | 117°C 15A 250V | | | 1 | 1 | | FS1.2 |
| 29 | R01 479 215 | RELAY | LY1F DC1 | | | 2 | 2 | | 88H |
| | R01 673 215 | | LY2F DC12V | 1 | 1 | | | | 88H |
| 30 | T7W 556 305 | REMOTE CONTROLLER CABLE | 12m | 1 | 1 | 1 | 1 | | |
| 31 | T7W B02 675 | FAN GUARD | | 2 | 2 | | | | |
| 32 | T7W B03 675 | | | | | 2 | 2 | | |
| 33 | T7W 351 077 | REMOCON COVER | | 1 | 1 | 1 | 1 | | |
| 34 | R01 20J 303 | INSULATOR | | 1 | 1 | | | | |
| | R01 30J 303 | INSULATOR | | | | 3 | 3 | | |

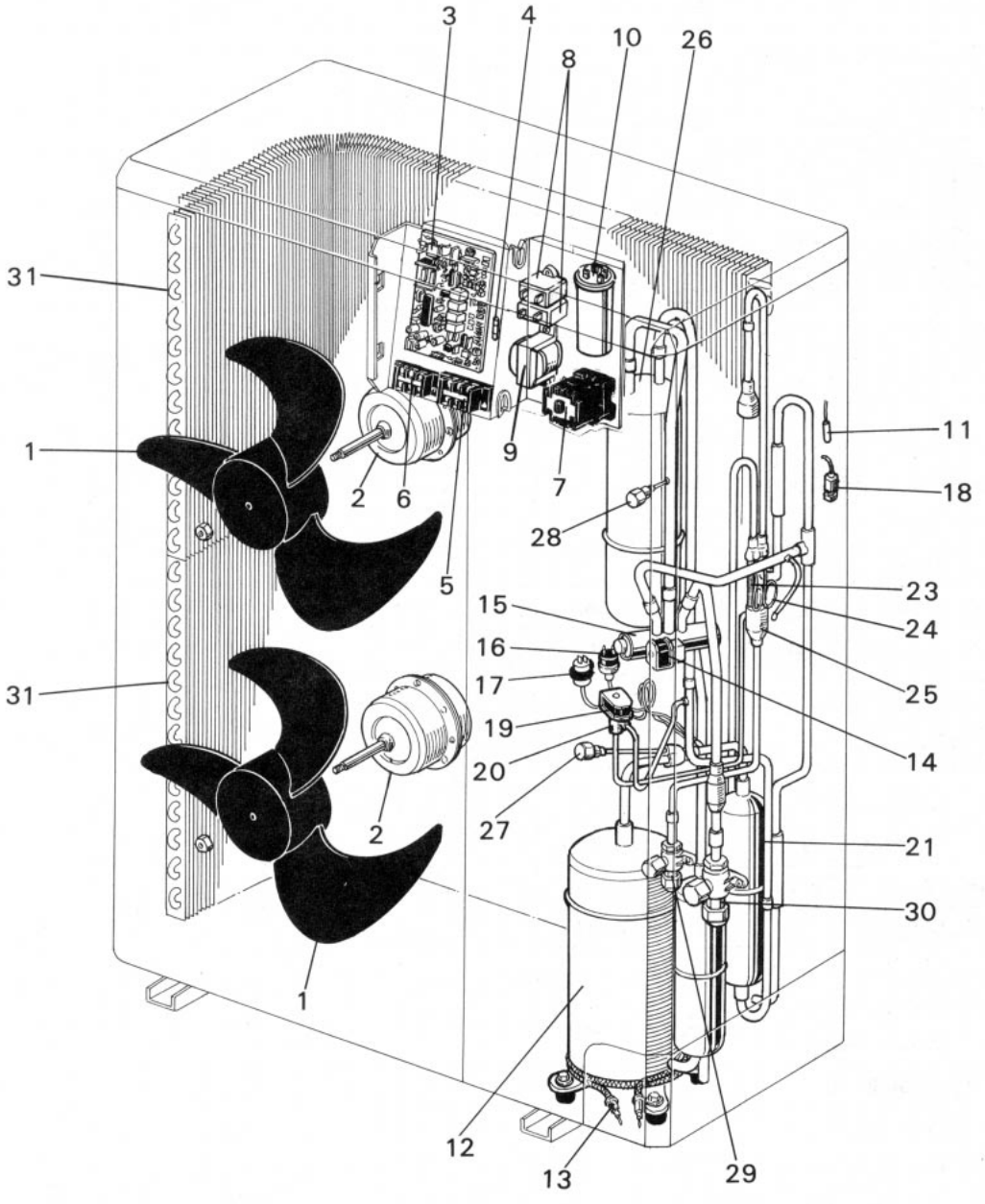
## PUH18EK FUNCTIONAL PARTS



※ This part is not shown in the illustration.

| No. | Parts No. | Parts Name | Specifications | Q'ty / set | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|
| | | | | PUH | | |
| | | | | 18EK | | |
| 1 | R01 A00 115 | PROPELLER | OUTDOOR FUNCTION | 1 | | |
| 2 | T7W 850 763 | FAN MOTOR | S6V-85FPH | 1 | | MF |
| 3 | T7W A30 315 | OUTDOOR CONTROLLER BOARD | | 1 | | O.B. |
| 4 | T7W 410 239 | FUSE | 250V 6A | 1 | | F |
| 5 | T7W 850 716 | TERMINAL BLOCK | 3P(L1,L2,GR) | 1 | | TB1 |
| 6 | R01 377 246 | | 3P(1,2,3) | 1 | | TB3 |
| 7 | T7W A30 708 | CONTACTOR | S-U12 208/230V | 1 | | 52C |
| 8 | R01 576 255 | FAN CAPACITOR | 3μF 440V | 1 | | C1 |
| 9 | T7W A30 799 | TRANSFORMER | RED:12.3VAC,0.06A<br>BRN:12.3VAC,0.06A | 1 | | T |
| 10 | T7W 969 723 | COMPRESSOR CAPACITOR | 30μF 370V | 1 | | C |
| 11 | R01 J01 202 | OUTDOOR COIL THERMISTOR | | 1 | | RT |
| 12 | T7W 969 238 | OVERCURRENT RELAY | MRA98881-90 | 1 | | 51C |
| 13 | T97 665 600 | COMPRESSOR | RH-247NAB | 1 | | MC |
| 14 | T7W 850 236 | CRANKCASE HEATER | 240V 30W | 1 | | HC |
| 15 | T7W 875 242 | R.V.COIL | | 1 | | 21S4 |
| 16 | T7W 875 403 | 4-WAY VALVE | | 1 | | |
| 17 | R01 A00 208 | CONTROL HIGH PRESSURE SWITCH | OPEN psiG 363 | 1 | | 63H1 |
| 18 | T7W A30 208 | PROTECT HIGH PRESSURE SWITCH | OPEN psiG 469 | 1 | | 63H2 |
| 19 | T7W 973 507 | FUSIBLE PLUG | | 1 | | |
| 20 | T7W 869 242 | B.V.COIL | | 1 | | 21R |
| 21 | R01 272 428 | BYPASS VALVE | | 1 | | |
| 22 | R01 V39 490 | OIL SEPARATOR | | 1 | | |
| 23 | R01 A00 425 | CAPILLARY TUBE | 0.098×0.024×39.4 | 1 | | |
| 24 | R01 L11 418 | RESTRICTOR VALVE | | 1 | | |
| 25 | T7W 851 425 | CAPILLARY TUBE | 0.157×0.079×33.5 | 1 | | |
| 26 | R01 A04 450 | STRAINER | | 1 | | |
| 27 | R01 A08 440 | ACCUMULATOR | | 1 | | |
| 28 | R01 590 413 | CHARGE PLUG | | 1 | | |
| 29 | R01 943 413 | | | 1 | | |
| 30 | R01 943 410 | BALL BALVE | 3/8 | 1 | | |
| 31 | R01 951 411 | | 5/8 | 1 | | |
| 32 | R01 A10 408 | OUTDOOR HEAT EXCHANGER | | 1 | | |

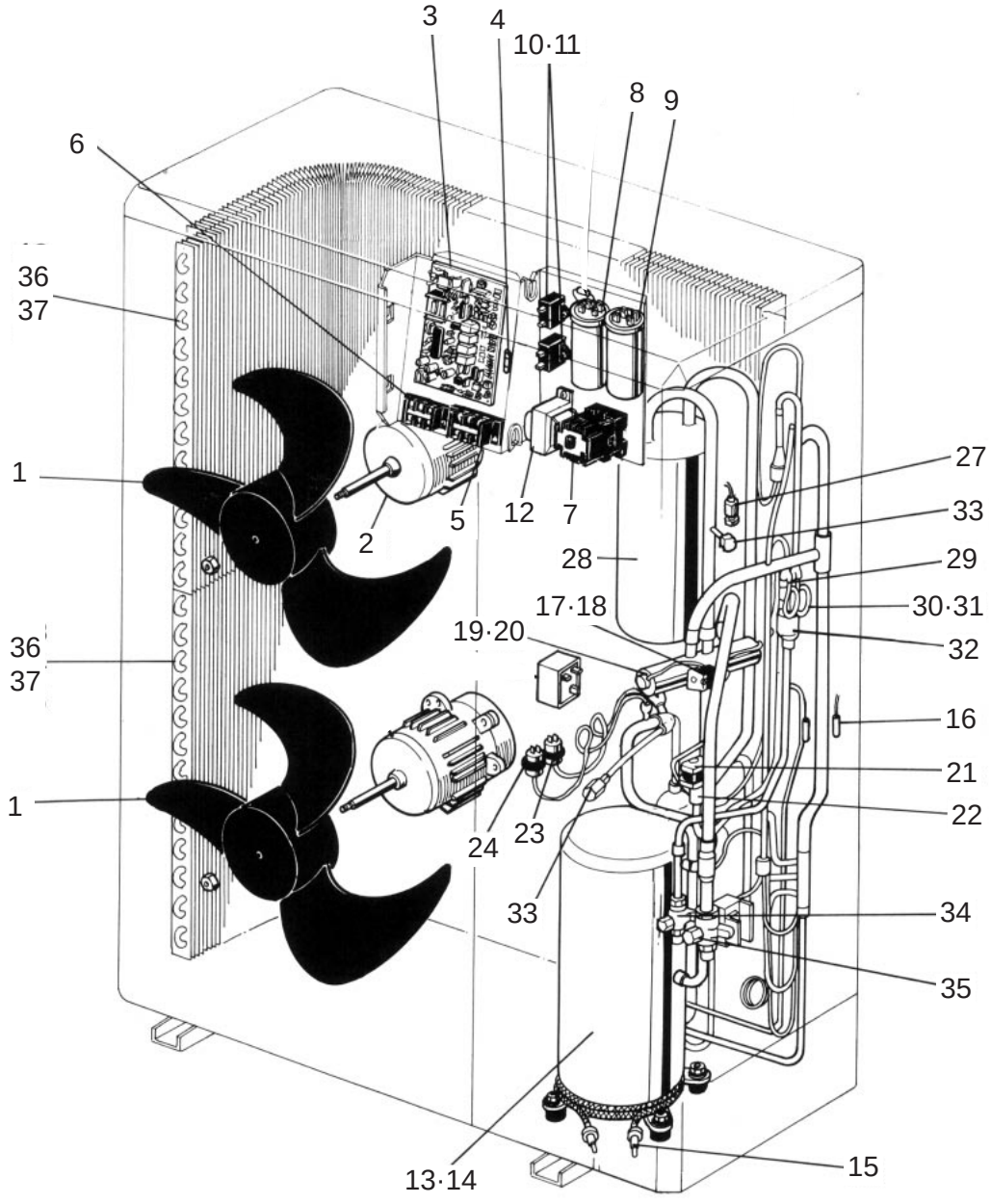
## PUH24EK FUNCTIONAL PARTS



※ This part is not shown in the illustration.

| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|
| | | | | PUH | 24EK | | |
| 1 | R01 A00 115 | PROPELLER | OUTDOOR FUNCTION | 2 | | | |
| 2 | T7W 851 763 | FAN MOTOR | S6V-60FPP | 2 | | | MF1,2 |
| 3 | T7W A30 315 | OUTDOOR CONTROLLER BOARD | | 1 | | | O.B. |
| 4 | T7W 410 239 | FUSE | 250V 6A | 1 | | | F |
| 5 | T7W 850 716 | TERMINAL BLOCK | 3P(L1,L2,GR) | 1 | | | TB1 |
| 6 | R01 377 246 | | 3P(1,2,3) | 1 | | | TB3 |
| 7 | T7W 867 708 | CONTACTOR | S-K25UR 208/230 | 1 | | | 52C |
| 8 | R01 653 255 | FAN CAPACITOR | 4μF 440V | 2 | | | C1,2 |
| 9 | T7W A30 799 | TRANSFORMER | RED:12.3VAC,0.06A<br>BRN:12.3VAC,0.06A | 1 | | | T |
| 10 | T7W 973 723 | COMPRESSOR CAPACITOR | 40μF 400V | 1 | | | C |
| 11 | R01 J07 202 | OUTDOOR COIL THERMISTOR | | 1 | | | RT |
| 12 | T97 517 300 | COMPRESSOR | NH-33NBD | 1 | | | 51C |
| 13 | T7W 851 236 | CRANKCASE HEATER | 240V 43W | 1 | | | MC |
| 14 | T7W A31 242 | R.V.COIL | | 1 | | | HC |
| 15 | T7W 260 403 | 4-WAY VALVE | | 1 | | | 21S4 |
| 16 | R01 A00 208 | CONTROL HIGH PRESSURE SWITCH | OPEN psiG 363 | 1 | | | |
| 17 | T7W A30 208 | PROTECT HIGH PRESSURE SWITCH | OPEN psiG 469 | 1 | | | 63H1 |
| 18 | T7W 973 507 | FUSIBLE PLUG | | 1 | | | 63H2 |
| 19 | T7W 869 242 | B.V.COIL | | 1 | | | |
| 20 | R01 272 428 | BYPASS VALVE | | 1 | | | 21R |
| 21 | R01 A14 490 | OIL SEPARATOR | | 1 | | | |
| 22 | R01 A00 425 | CAPILLARY TUBE | 0.098×0.024×39.4 | 1 | | | |
| 23 | R01 993 418 | RESTRICTOR VALVE | | 1 | | | |
| 24 | R01 600 425 | CAPILLARY TUBE | 0.126×0.063×17.3 | 2 | | | |
| 25 | R01 A11 450 | STRAINER | | 1 | | | |
| 26 | R01 A12 440 | ACCUMULATOR | | 1 | | | |
| 27 | R01 590 413 | CHARGE PLUG | | 1 | | | |
| 28 | R01 943 413 | | 3/8 | 1 | | | |
| 29 | R01 943 410 | BALL BALVE | 5/8 | 1 | | | |
| 30 | R01 951 411 | | | 1 | | | |
| 31 | T7W A31 408 | OUTDOOR HEAT EXCHANGER | | 2 | | | |

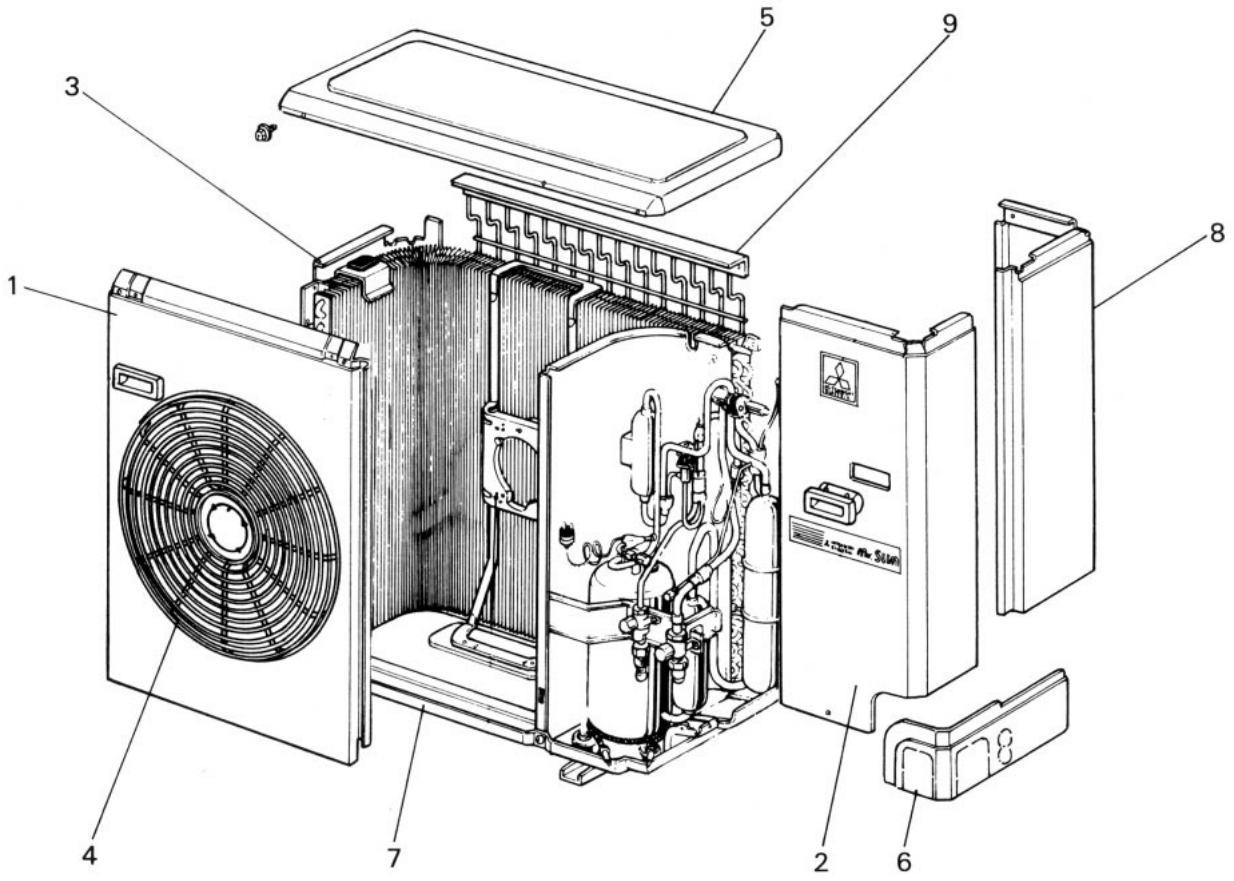
## PUH30/36EK FUNCTIONAL PARTS



※ This part is not shown in the illustration.

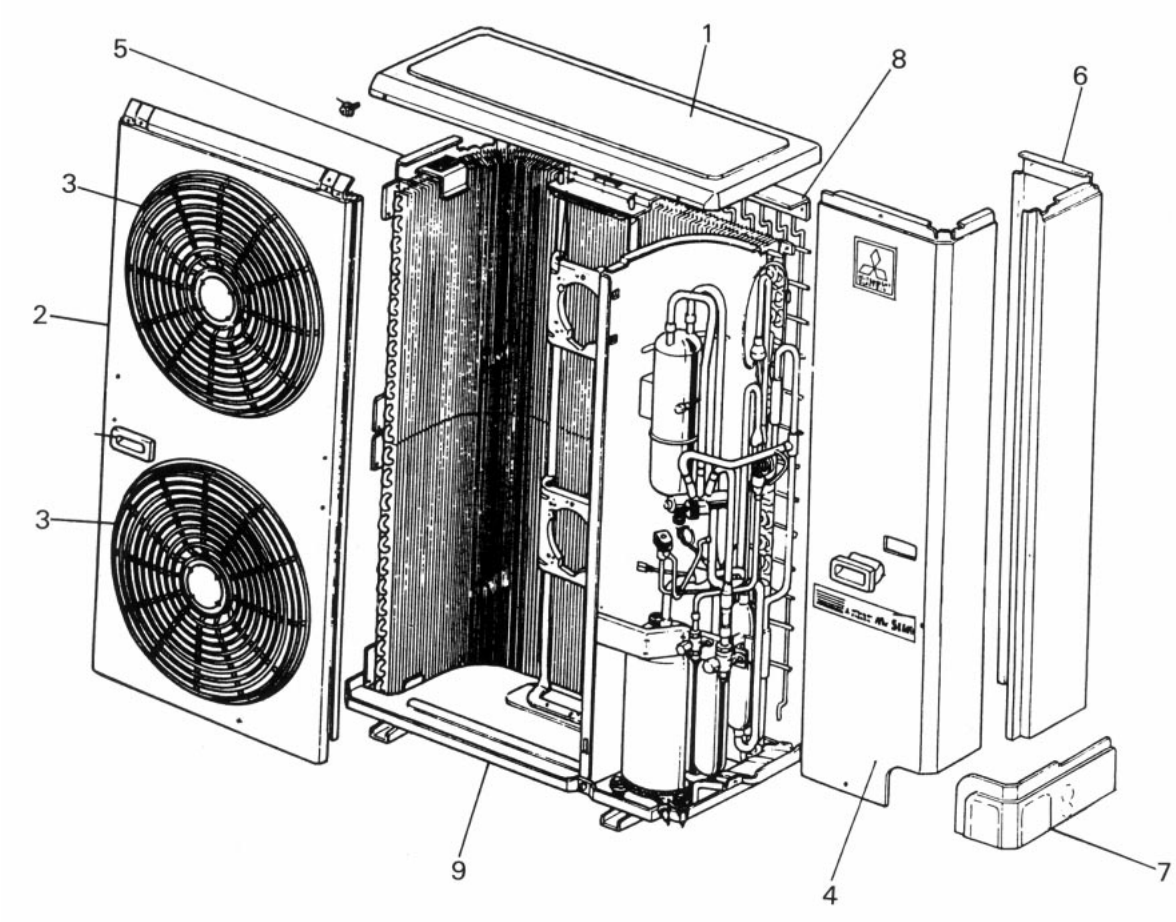
| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|
| | | | | PUH | | | |
| | | | | 30EK | 36EK | | |
| 1 | R01 A00 115 | PROPELLER | OUTDOOR FUNCTION | 2 | 2 | | |
| 2 | T7W 852 763 | FAN MOTOR | VC086DC | 2 | 2 | | MF1,2 |
| 3 | T7W A30 315 | OUTDOOR CONTROLLER BOARD | | 1 | 1 | | O.B. |
| 4 | T7W 410 239 | FUSE | 250V 6A | 1 | 1 | | F |
| 5 | T7W 850 716 | TERMINAL BLOCK | 3P(L1,L2,GR) | 1 | 1 | | TB1 |
| 6 | R01 377 246 | | 3P(1,2,3) | 1 | 1 | | TB3 |
| 7 | T7W 867 708 | CONTACTOR | S-K25UR | 1 | 1 | | 52C |
| 8 | T7W 867 723 | COMPRESSOR CAPACITOR | 50μF 400V | 1 | | | C |
| 9 | T7W 975 723 | | 60μF 360V | | 1 | | C |
| 10 | R01 653 255 | FAN CAPACITOR | 4μF 440V | 2 | | | C1,2 |
| 11 | R01 576 255 | | 3μF 440V | | 2 | | C1,2 |
| 12 | T7W A30 799 | TRANSFORMER | RED:12.3VAC,0.06A<br>BRN:12.3VAC,0.06A | 1 | 1 | | T |
| 13 | T97 511 300 | COMPRESSOR | NH-41NAD | 1 | | | MC |
| 14 | T97 518 300 | | NH-47NAD | | 1 | | MC |
| 15 | T7W 851 236 | CRANKCASE HEATER | 240V 43W | 1 | 1 | | HC |
| 16 | R01 J01 202 | THERMISTOR | PIPE TEMPERATURE | 1 | 1 | | RT |
| 17 | T7W A31 242 | R.V.COIL | | 1 | | | 21S |
| 18 | T7W 875 242 | | | | 1 | | 21S4 |
| 19 | T7W 261 403 | 4-WAY VALVE | | 1 | | | |
| 20 | T7W 258 403 | | | | 1 | | |
| 21 | T7W 869 242 | B.V.COIL | | 1 | 1 | | 21R |
| 22 | R01 A14 428 | BYPASS VALVE | | 1 | 1 | | |
| 23 | R01 A00 208 | CONTROL HIGH PRESSURE SWITCH | OPEN psiG 363 | 1 | 1 | | 63H1 |
| 24 | T7W A30 208 | PROPECT HIGH PRESSURE SWITCH | OPEN psiG 469 | 1 | 1 | | 63H2 |
| 25 | R01 A14 490 | OIL SEPARATOR | | 1 | 1 | | |
| 26 | R01 A00 425 | CAPILLARY TUBE | 2.5×0.6-1000mm | 1 | 1 | | |
| 27 | T7W 973 507 | FUSIBLE PLUG | | 1 | 1 | | |
| 28 | R01 A14 440 | ACCUMLATOR | | 1 | 1 | | |
| 29 | R01 993 418 | RESTRICTOR VALVE | | 2 | 2 | | |
| 30 | R01 591 425 | CAPILLARY TUBE | 0.157×0.079×23.6 | 2 | | | |
| 31 | R01 591 425 | | 0.157×0.079×17.7 | | 2 | | |
| 32 | R01 A14 450 | STRAINER | | 1 | 1 | | |
| 33 | R01 943 413 | CHARGE PLUG | | 2 | 2 | | |
| 34 | R01 670 410 | BALL BALVE | 1/2 | 1 | 1 | | |
| 35 | R01 670 411 | | 3/4 | 1 | 1 | | |
| 36 | R01 A14 408 | OUTDOOR HEAT EXCHANGER | | 2 | | | |
| 37 | R01 A16 408 | | | | 2 | | |

## PUH18EK STRUCTURAL PARTS



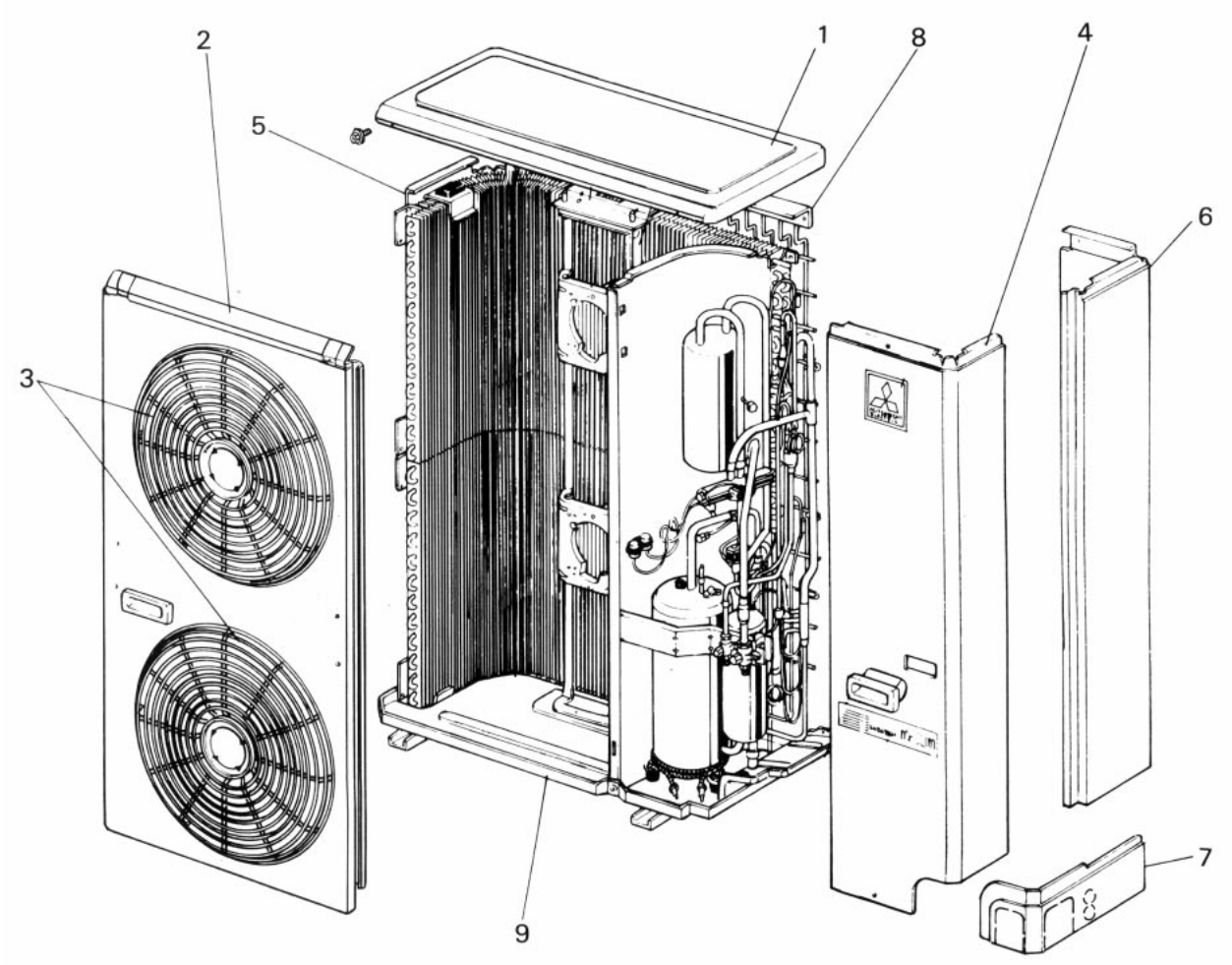

| No. | Parts No. | Parts Name | Specifications | Q'ty / set | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|
| | | | | PUH 18EK | | |
| 1 | R01 A08 668 | FRONT PANEL | OUTDOOR FUNCTION | 1 | | |
| 2 | R01 A08 661 | SERVICE PANEL | | 1 | | |
| 3 | R01 A08 662 | SIDE PANEL | | 1 | | |
| 4 | R01 A00 675 | FAN GUARD | | 1 | | |
| 5 | R01 A00 641 | TOP PANEL | | 1 | | |
| 6 | R01 A00 658 | PANEL COVER | | 1 | | |
| 7 | R01 A00 686 | BASE ASSEMBLY | | 1 | | |
| 8 | R01 A08 682 | REAR PANEL | | 1 | | |
| 9 | R01 A08 698 | REAR GUARD | | 1 | | |

## PUH24EK STRUCTURAL PARTS




| No. | Parts No. | Parts Name | Specifications | Q'ty / set | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|
| | | | | PUH 24EK | | |
| 1 | R01 A00 641 | TOP PANEL | | 1 | | |
| 2 | R01 A11 668 | FRONT PANEL | | 1 | | |
| 3 | R01 A00 675 | FAN GUARD | | 2 | | |
| 4 | R01 A11 661 | SERVICE PANEL | | 1 | | |
| 5 | R01 A11 662 | SIDE PANEL (LEFT) | | 1 | | |
| 6 | R01 A11 682 | REAR PANEL | | 1 | | |
| 7 | R01 A00 658 | PANEL COVER | | 1 | | |
| 8 | R01 A11 698 | REAR GUARD | | 1 | | |
| 9 | R01 A10 686 | BASE ASSEMBLY | | 1 | | |

## PUH30/36EK STRUCTURAL PARTS




| No. | Parts No. | Parts Name | Specifications | Q'ty / set | | Remarks (Drawing No.) | Wiring Diagram Symbol |
|---|---|---|---|---|---|---|---|
| | | | | PUH | | | |
| | | | | 30EK | 36EK | | |
| 1 | R01 A14 641 | TOP PANEL | | 1 | 1 | | |
| 2 | R01 A14 668 | FRONT PANEL | | 1 | 1 | | |
| 3 | R01 A00 675 | FAN GUARD | | 2 | 2 | | |
| 4 | R01 A14 661 | SERVICE PANEL | | 1 | 1 | | |
| 5 | R01 A14 662 | SIDE PANEL (LEFT) | | 1 | 1 | | |
| 6 | R01 A14 682 | REAR PANEL | | 1 | 1 | | |
| 7 | R01 A00 658 | PANEL COVER | | 1 | 1 | | |
| 8 | R01 A14 698 | REAR GUARD | | 1 | 1 | | |
| 9 | R01 A14 686 | BASE ASSEMBLY | | 1 | 1 | | |

# 13 OPTIONAL PARTS

## 1. REFRIGERANT PIPES

FOR model: PKH18/24FK

| Part No | PAC-05FFS-E | PAC-07FFS-E | PAC-10FFS-E | PAC-15FFS-E |
|---|---|---|---|---|
| Pipe length | 5m | 7m | 10m | 15m |
| Pipe size OD | Liquid : 3/8 Gas : 5/8 | | | |
| Connection method | Indoor unit : Flared Outdoor unit : Flared | | | |

FOR model : PKH30/36FK

| Part No | PAC-SC51PI-E | PAC-SC52PI-E | PAC-SC53PI-E | PAC-SC54PI-E |
|---|---|---|---|---|
| Pipe length | 5m | 7m | 10m | 15m |
| Pipe size OD | Liquid : 1/2 Gas : 3/4 | | | |
| Connection method | Indoor unit : Flared Outdoor unit : Flared | | | |

Note 1. How to connect refrigerant pipes.
Factory supplied optional refrigerant pipings contain refrigerant at the above atmospheric pressures. As long as the connection takes no more than 5 minutes, no air will enter, and there will be no need for air purging. Remove the blind caps and make the connections within 5 minutes. After the connections for the indoor and outdoor units are made, open the stop valve on the outdoor unit to allow refrigerant gas to flow.
If piping length exceeds 5m,an additional charge of refrigerant is needed.

Note 2. The following main parts are contained in the optional refrigerant piping kit.
Heat insulating cover, vinyl tapes, nipples, sleeve and flange (for wall hole),connecting cables.

## 2. TIMER

When using a program timer, PAC-SK65PT, a program timer adapter (PAC-825AD) is also needed.

| Part No. | PAC-SK65PT (with set back function) |
|---|---|
| Model Name | Program timer |

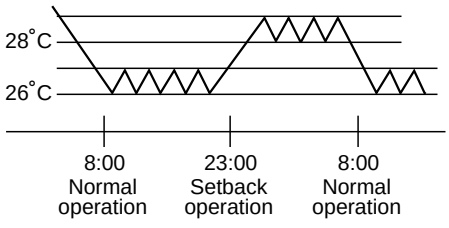
### 2-1 Program timer specifications

| | |
|---|---|
| Part name | Program timer |
| Part No. | PAC-SK65PT |
| Exterior dimensions | 120 × 120 × 15mm |
| Installation | Wall mount |
| Type of clock | Quartz |
| Clock accuracy | ± 50s / month |
| Display — Time<br>— Week<br>— Timer setting | Liquid cystal display<br>Liquid cystal display<br>Liquid cystal display |
| Program cycle | 24 hours |
| Timer setting unit | 30 minutes |
| No. of set points | 48 / day |
| Power rating | 5V DC |
| Se back function | Provided |

### 2-2 Feature of program timer

(1) Daily timer function
Daily timer can be set in 30 minutes units for up to 24 hours.
Each unit can be set for unit ON, unit OFF, or setback operation.

(2) Setback operation (PAC-SK65PT)
Set back operation is useful for reducing running costs
e.g. At a hotel with a 24-hour system
8:00~23:00 Cooling operation with set temperature at 26°C
23:00~8:00 Setback operation with 2 degrees of setback
As shown in the chart on the right, the set temperature rises 2 degrees automatically during the setback operation. When the setback operation ends, nomal operation will begin.

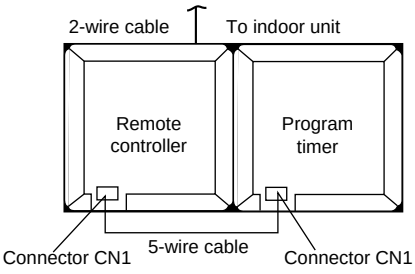



(3) Weekly timer function
Daily timer function can apply to each day of the week.

**2-3. How to connect program timer**

(1) Install the program timer next to the remote controller the same way as the remote controller is installed.

(2) Connect the program timer and the remote controller with a 6-wire cable as shown in the figure below




NOTE:While the program timer is connected to the remote controller, the 24hour ON/OFF timer on the remote controller will not operate.

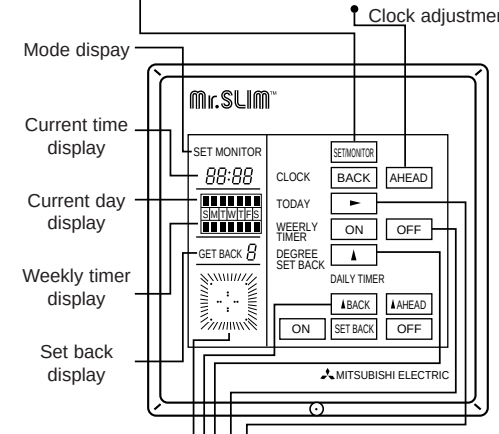
**2-4 Names and functions**
**<PAC-SK65PT>**

Mode selector button : Using this button to select ¨MONITOR¨ or ¨SET¨ mode.

¨MONITOR¨ : Indicates the current timer setting. All buttons except SET / MONITOR will not work. This is the normal status.

¨SET¨ : ¨SET¨ is used to set the time, change the day of the week, and program the daily and weekly timer.

Clock adjustment button : Used to adjust the current time. Press AHEAD button to advance the time. Each time the button is pressed the time advances by 1 minute. Pressing continuously advances 1 minute in a 0.5 second interval. When the lower digit of minute becomes 0 the indication advances in 10 minutes unit. BACK button is used for reversing the time. Each time the button is pressed the time reverses by 1 minute. Pressing continuously reverses the time by 1 minute in a 0.5 second interval. When the lower digit of minute becomes 0 the indication reverses in 10 minutes unit.




Day setting button : Used to adjust the day of the week. Pressing BACK button moves the day light display in the order of S→M→T→W

Weekly timer button : Used to set the weekly timer.

Set back button : Used to set the set back amount. Set back can bee set in the range of 1 to 48˚F in 34˚F unit.

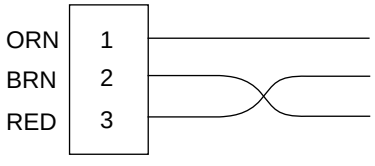
Daily timer button : Used to set the timer settings in units of 30 minutes.

NOTE : Display above is only an exanple

## 3. TIMER ADAPTER

This adapter is needed for system control and for operation via external contacts. Adapter connection is described on page 57.

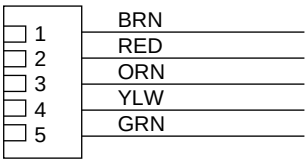
| Part No. | PAC-SA89TA-E |
|---|---|



## 4. MULTIPLE REMOTE CONTROLLER ADAPTER

This adapter is needed for remote indication (operation/check). Adapter connection is described on page 69.

| Part No. | PAC-SA88HA-E |
|---|---|



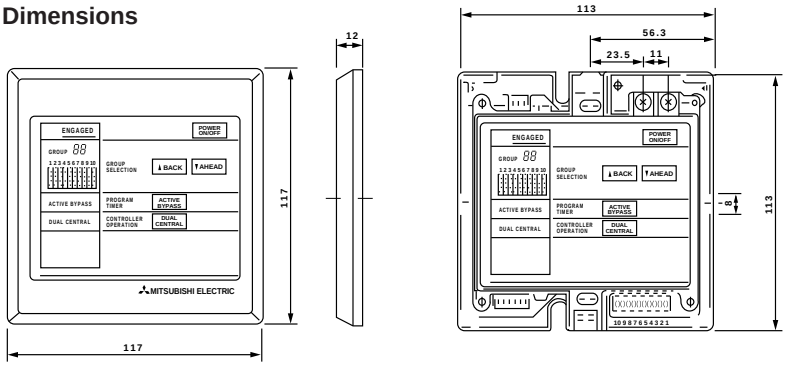

## 5. CENTRALIZED REMOTE CONTROLLER

Allows individual or combined control of up to 16 units. When using the PAC-805RC, the program timer adapter (PAC-825AD)is also needed. See page 90.

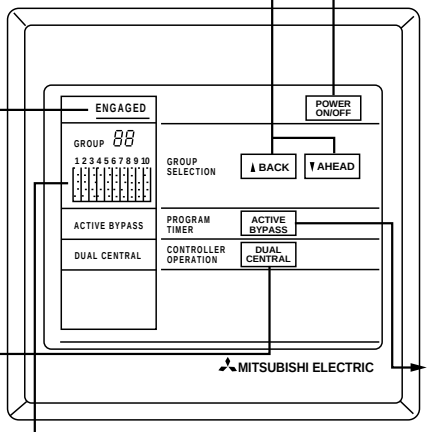
| Part No. | PAC-805RC |
|---|---|

### 5-1. Dimensions

**Unit : mm**




### 5-2. Functions




"ENGAGED" indicator
When this indicator is lit, transmission is in progress and all switches are inoperative.

DUAL/CENTRAL switch
This change-over switch governing the operation of the accessory remote controller.

"DUAL"
Instructions from both the accessory remote controller and the centralized remote controller are valid. (Priority given to the last instruction received.)

"CENTRAL"
ON/OFF switching by the accessory remote controller is invalidated. Controll is by the centralized remote controller only.
Initial setting is "DUAL".

LCD Matrix Display
This display indicates the operational status of all connected units either by steady lighting or by flashing.

POWER ON/OFF switch
Operation ON/OFF switch.

▲BACK ▼AHEAD buttons
These buttons are used to designate the attached unit(s). (They designate the unit that is centrally controlled.)

●When group “00” is designated; collective ON/OFF instruction is sent to all units.

●When group “01”-“16“ is designated; ON/OFF instruction is sent to the designated units only.

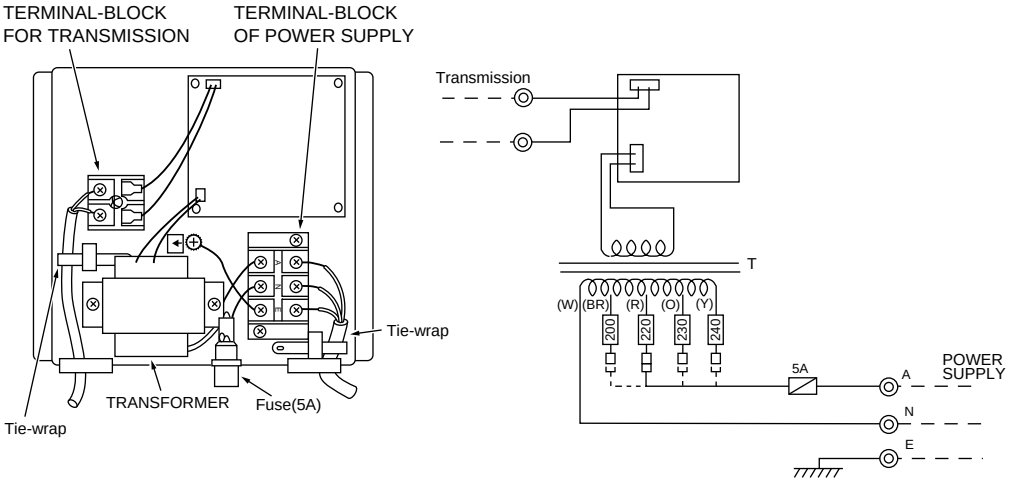
ACTIVE/BYPASS switch
This is a change-over switch for the program timer.
(It selects timer operation on the program timer.)
Use “BYPASS” when a program timer is not connected.
“ACTIVE”
The switch tums ON/OFF operational instructions from the program timer automatically.
“BYPASS”
ON/OFF Operation is by the centralized remote controller only.
Initial setting is “BYPASS”.

Independent “DUAL / CENTRAL” and “ACTIVE / BYPASS” setting of all the groups is possible. When the power supply to the centralized remote controller is cut due to power failure, all settings will return to original “DUAL” and “BYPASS”.

**5-3 Connection method**

(1) Connections in the power supply cord.

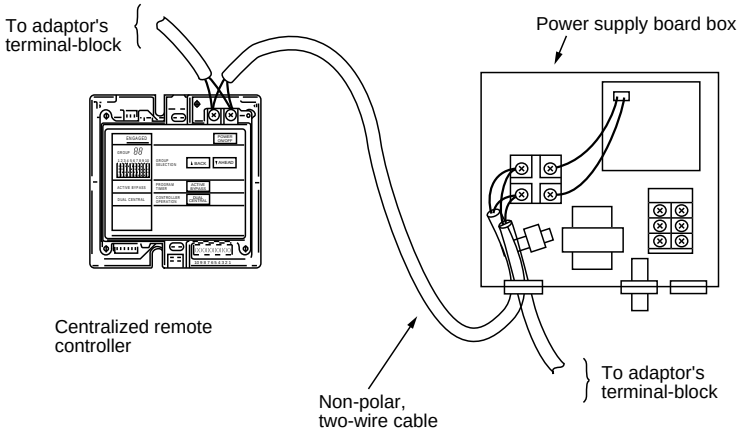
1. Connect the power supply cord to the power supply terminal-block and fix it in-place with a tie-wrap.
   Connect a single phase 200V AV (220, 230, 240V) to Ⓐ Ⓝ.
   As Ⓔ is the GND terminal, be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap. Use a Ø1.6 (AWG 14) or above two-wire cable for the transmission line.
   **CAUTION** : Never connect the power supply cord to the transmission terminal-block.



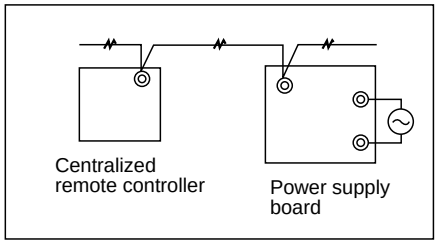

Wiring has to be changed when
a 200,230 or 240V power is used.

(2) Connection method of centralized remote controller and power supply board.

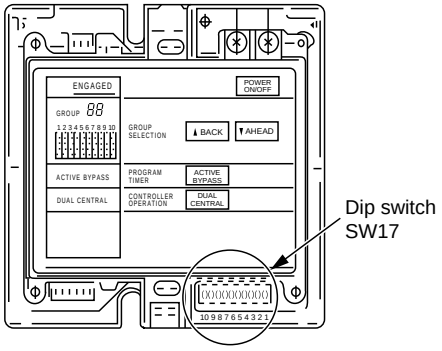
1. Connect the centralized remote controller and power supply board with a non-polar, two-wire cable.




2. Wiring diagram




3. Be sure to set the maximum address number with the dipswitch SW17 on the centralized remote controller.

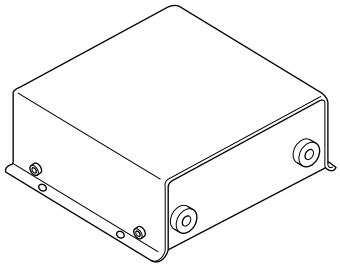
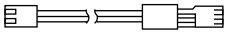
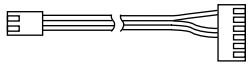
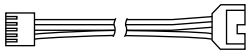
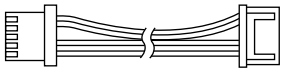


6. PROGRAM TIMER ADAPTER

This adapter is needed when a program timer(PAC-SK65PT)or a centralized remote controller(PAC-805RC)is used.

| Part No. | PAC-825AD |
|---|---|

6-1 Parts included

| ① ADAPTER ····· x1 | ② 3-core cable ····· x1 | ③ 3-core cable ····· x1 |
|---|---|---|
|  |  Length : 2m (6' 7") |  Length : 2m (6' 7") |
| | ④ 4-core cable ····· x1 | ⑤ 5-core cable ····· x1 |
| |  Length : 2m (6' 7") |  Length : 2m (6' 7") |

6-2 Connection method

Connection and wiring methods differ with the type of the indoor unit used. Confirm the type before carrying out the work.

(1) Connections in the adapter box

1. Connect the power supply cord to the terminal-block and fix it in-place with a tie-wrap.
   Connect a single phase 200V (220, 230, 240V) AV to Ⓐ Ⓝ.
   As Ⓔ is the GND terminal, be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap (when a centralized remote controller is being used).
   CAUTION : Never connect the power supply cord to the transmission terminal-block

Fig-1

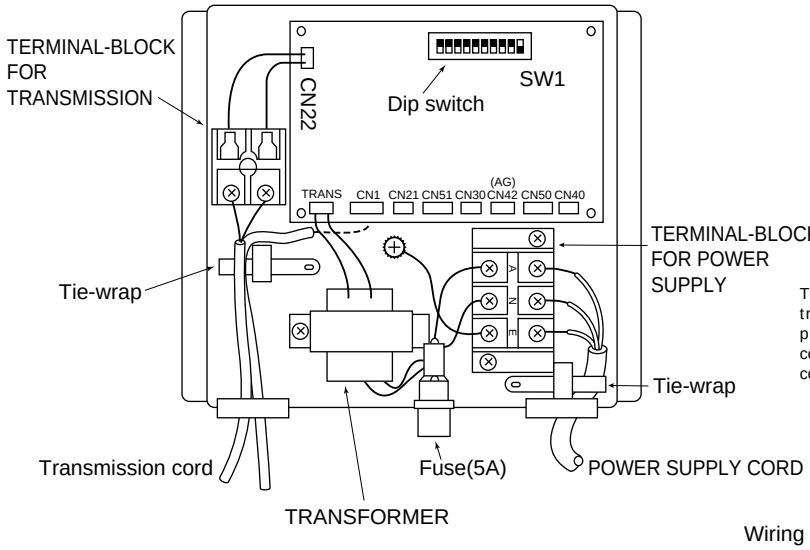
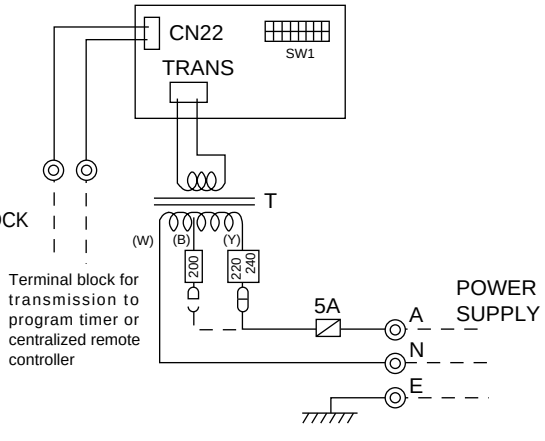



Fig-2




Wiring has to be changed when 200V power supply is used.

(2) When the centralized remote controller is used, set the address number with the dipswitch SW1 of the program timer adapter.

# Mr.SLIM

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